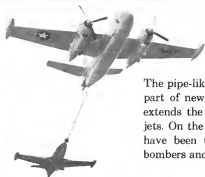


AVIATION WEEK

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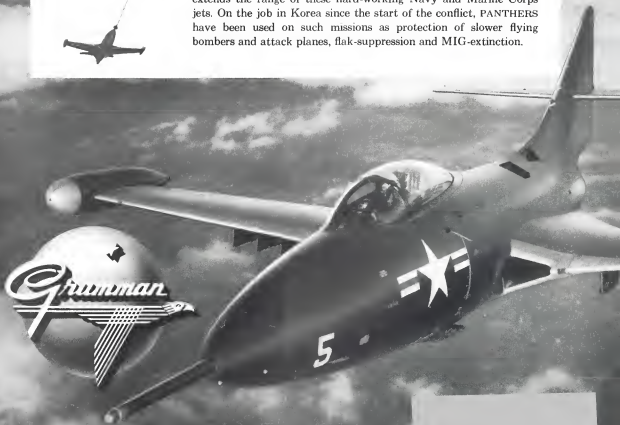
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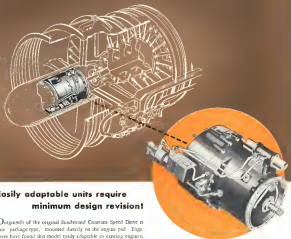
Longer Legs for NAVY PANTHERS

The pipe-like extension on the nose of this GRUMMAN PANTHER is part of newly developed in-flight refueling equipment that greatly extends the range of these hard-working Navy and Marine Corps jets. On the job in Korea since the start of the conflict, PANTHERS have been used on such missions as protection of slower flying bombers and attack planes, flak-suppression and MIG-extinction.



GRUMMAN AIRCRAFT ENGINEERING CORPORATION, BETHP
Contractors to the Armed Forces

DEPENDABLE A-C POWER!...made possible by Sundstrand Constant Speed Drives



**Easily adaptable units require
minimum design revision!**

Outgrowth of the original Sundstrand Constant Speed Drive in this package type, mounted directly on the engine pulley. Engineers have found this model easily adaptable to existing engines, highly efficient in extraction of power, and readily maintainable. Other Sundstrand drives include the "integral type" which is designed into the main aircraft engine and uses engine oil, also the "split-drive-type" where the hydraulic pump is mounted on the engine accessory pulley, while the hydraulic motor is attached to the generator, normally located in the fuselage. For your best bet on the drive most suitable to your requirements, check on Sundstrand's reliable records, expert engineering, and proven production.

What you can expect from Sundstrand Constant Speed Drives

- Maximum, minimum power for A-C generators, through broad speeds of 3000-10000 rpm
- Any number of A-C generators can be operated in parallel at standard 400 cycle frequency within $\pm 1\frac{1}{2}\%$ under steady-state conditions.
- Speeds are synchronized and the load is distributed equally within $\pm 2\%$ under steady-state conditions—regardless of changes in electrical system loads or maintenance or deterioration of the aircraft engine.
- Completely drainable, fully integrated systems—designed on several leading types of aircraft.



**SUNDSTRAND
AIRCRAFT
HYDRAULICS**
SUNDSTRAND MACHINE TOOL CO.
HYDRAULIC DIVISION, ROCKFORD, ILL.

ALLCRAFT AND INDUSTRIAL HYDRAULIC TRANSMISSIONS, PUMPS, MOTORS AND VALVES • OIL ENGINE PUMPS • AIR SAMPLERS
LATHES • MILLING, DRUMMING AND SPECIAL MACHINES • REGRADING TOOLS • MACHINE TOOLS

B.F. Goodrich



How B. F. Goodrich makes it hot for ice

SUPPLYING ice protection for any size or shape of a turbine jet is no longer a problem for B. F. Goodrich engineers. With double electric rubber strip design, a skin tight fit over bulges, smooth, steady curves and corners.

A B. F. Goodrich De-Icing development, electric rubber can be made only one-eighth of an inch thick. Its use of electrical resistance when supplied heat to remove thin water droplets before they evaporate before they freeze. It is the most efficient method of supplying heat non-stop hour it simplifies design, saves weight, can be contained so it requires little power in operation—no lead wires carry the electricity furnished by the plane's regular power supply.

Here are most applications—all at different stages—where the BFG electric rubber De-Icing has given successful ice protection.

The propeller (shown above) is protected not from cutting down a plane's speed and maneuverability.

In a jet engine's intake, a vapor ice from choking off engine air, vital for combustion.

The air intake is heated electrically to supply for cabin heating systems and for cooling engine accessories.

The rubber heater is kept on from burning and causing stress to snap off in the wind.

The electric heater is kept on from burning and causing stress to snap off in the wind.

The B. F. Goodrich electric rubber De-Icing is also used on wings, hydrolic lines, water seals, sparrows, doors, jet engine doors and many other engine parts. It is a typical development of BFG's engineering and research facilities. Other B. F. Goodrich research products include tires, wheels and landing gear, parachutes, De-Icing, Pressure Sealing, Zippers, Avionics, Inflatable seals, Flammable substances, fuel cells, Avionics, Avionics. The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.

B.F. Goodrich
FIRST IN RUBBER

AIRBORNE MOTOR powers canopy on Banshee



An Airborne® 2100 motor with built-in air filter provides electrical operation of the canopy actuator on the F-105 Banshee fighter.

Airborne offers two sizes of motors for applications requiring 20 to 250 horsepower duty operation. Each size features magnetic clutch and brake for quick stopping and positive holding during power off periods.

If you have applications requiring motors of this type, write us. We'll be glad to send you complete literature on these products.

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rpm	400	600	800	1000	1200
1000	21.7	35	48.8	62.5	76.2
2000	3.28	5.25	7.25	9.25	11.25

AIRBORNE
ACCESSORIES CORPORATION
1813 Central Express Hwy. N.E., S.E.

Aviation Week

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December 29, 1952

Number 26

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INTO 1953...



Seventy-five hundred pairs of TEMCO sleeves are being rolled up for the big job ahead in 1953.

TEMCO is under way on the biggest project of its history as prime contractor for a substantial quantity of McDonnell F3H DEMON jet fighters for the U. S. Navy.

TEMCO made other great strides in 1952. It completed a major installation at Greenville, Texas, for its vast over-haul-modification work on multi-engine aircraft. It further expanded its Dallas manufacturing facilities to provide for a new all-time high production level without loss of time on its Boeing, Lockheed, Douglas and Martin sub-contracts. Its own military trainer, the YF3H BUCKAROO, currently under consideration by the U. S. Air Force, received additional interest from foreign governments. Its subsidiary plant at Garland, Texas, continued to deliver on schedule under sub-contracts from Consolidated, Beech and others.

In the same period, TEMCO design engineers were busy on new projects of even greater scope for America's air defense. In 1952 TEMCO became TEMCO AIRCRAFT CORPORATION... 1953 will add new meaning to the name.



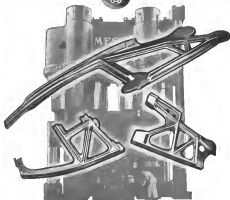
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DALLAS, TEXAS
AIRCRAFT CORPORATION

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Greater Size and Speed in Aircraft
have created engineering problems, the solution of which has required larger and larger forgings of high-tensile aluminum alloy. Examples shown above are forged structural members used in a modern military bomber, the largest were from seven heat-treated 6061-T6 aluminum alloy. These are forged in one piece, the biggest ever built in this country.

Wyman-Gordon Experience—the most extensive in the industry—a keeping abreast of new forging demands involving the use of Steel, Aluminum, Magnesium, High Density Alloys and Titanium.

**Standard of the Industry for
More than Sixty-five Years**

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FORGINGS OF ALUMINUM • MAGNESIUM • STEEL
WORCESTER, MASSACHUSETTS
HARVEY, ILLINOIS DETROIT, MICHIGAN

An \$4 million control center is to be built by Strategic Air Command at Offutt AFB, Omaha, Neb.

New Reverse Prop Proposal Circulated

A proposal to install all reversing propeller control systems on transport airplanes to prevent unauthorized propeller reversal is being circulated in the industry by Don Wright, acting chief of the CAA Aircraft Engineering Division.

Proposal involves the Hamilton Standard propeller governor modification with a decrease pitch relief valve (Aviation Week, Nov. 17, p. 76). It also involves a covering order on Cessna propellers installed on about 10 Bonanza and Cessna 240 transports.

The modification is described as soon to be operative to a relief valve change proposed by Air Line Pilot Action in March 1952 (Aviation Week Apr. 14, p. 84).

Industry has been asked to comment on the proposal by Jan. 7. Data for where and maintenance compliance will depend on how fast Hamilton Standard produces the governor modification, a CAA official stated.

The Hamilton Standard propeller modification applies to all Douglas DC-6 series and to Cessna 240 and 340 airplanes which do not have "left to reverse" thrusts. The proposed device provides that the propeller reversing control shall be substantially different from the motion for closing the thrusts.

Domestic

Douglas C-124A liftrunner (DC-64) has started trans-Atlantic operations for MATS. Initial flight carried 51 passengers and more than 6,000 lb of mail from Westover AFB, Mass., to Frankfurt, Germany.

Delta Air Lines has accepted delivery of the first of its 10 Convair-Lear 140s. It marked the twenty-eighth 140 delivered on a total of 775 ordered.

Guided missile training for USAF personnel at USAF Missile Test Center, Decatur, Fla., has been started by Bell Aircraft Corp., N. Y.

John C. Nook, 50, who has held senior positions with Pan American World Airways as Latin America vice president since 1949, died Dec. 13.

An \$4 million control center is to be built by Strategic Air Command at Offutt AFB, Omaha, Neb.



DC-4 IS RECEIVED BY THE AIRWAYS CO. LTD., Chicago, sponsored by Maj. Louis Ruffel, Spokane, operations commander (left), who is greeted by C. H. Collins, vice president, maintenance and engineering, National Airlines, representing the plane's owner, William C. Walsh, who suggested the transaction, in center.

For the second consecutive year the board of William Acheson is offering \$2,000 fellowships to California University Graduate School of Business for original research in air transportation.

Alan Mac Simpson, 45, widely known in the aviation industry as assistant executive treasurer of National Aeronautics Assn., died in Emergency Hospital, Washington, D. C., Dec. 17. He had been on the NAA staff since 1936.

An American Airlines spokesman says it has no plans to agree to install the newly collected Lear-12 autopilot in one of its DC-7s, contrary to published reports. AA recently cancelled all bid orders of the Sperry A-12 autopilot originally scheduled for use on its 15 new DC-7s in part of a crackdown on unnecessary equipment which adds to maintenance load.

General Electric Co.'s Lincoln plant, near Cincinnati, which manufactures J47 engines, has been renamed the Ruskalk plant.

Boeing Aircraft Corp. has elected the following officers for coming year: O. A. Beffert, president; John F. Galt, vice president and general manager; T. A. Wells, vice president and chief engineer; Frank E. Haddock, vice president and controller; John A. Elliott, secretary-treasurer; and L. W. Hartz, assistant secretary. Booth, Galt, Haddock, and Elliott, Jr., Douglas S. Wilson and

T. A. Wells returned their places on the board of directors.

Dr. Christopher E. Barstall, Jr., was elected chairman of the board of directors of the National Electronics Conference at the annual meeting held Dec. 10 at Avenue Research Foundation of the new Institute of Technology, of which he is assistant director.

Financial

McDonnell Aircraft Corp., St. Louis, Mo., has declared a regular quarterly dividend of \$5 each payable Jan. 2 to shareholders on record on Dec. 26.

Ryan Aeronautical Co., San Diego, Calif., announced profit of \$575,359 for the last quarter Oct. 31, more than double that for 1951. Net sales for the current period were \$35,064,250, a 57% increase over the previous annual period.

Ryan Aeronautical Co. has recently received 36 million worth of new orders, including \$2 million from General Electric for J47 jet engines and \$1 million each from Douglas Aircraft Co. and Ford Motor Co.

International

Aero Canada CF-100, two jet all-weather fighter-bomber, L100 was from Ottawa to Winnipeg, Canada, in 2 hr. 40 min., reportedly the longest jet plane flight ever made in the Americas.

International air cargo service was started by Lorne Airways Ltd., Toronto, Canada, from that city to Mexico, Baltimore, and Kingston, Jamaica, B. W. I., using Aero Trader transport. Most was carried on aerial flights.

Japanese Aerial lost her own woman's speed mark over a closed 100-ha. course when on Dec. 21 she flew a Sud-Est built Delft Vampire Mk. 53 Mustang fighter powered by a Hispano-Suiza jet engine. Her average speed was 314.37 mph.

The Aeronautical Research and Advisory Council of North Atlantic Treaty Organization held its second meeting in Rome last week. Dr. Theodore Von Karman, chief of the Scientific Advisory Board, Office of USAF Chief of Staff, and Dr. Hugh L. Dryden, director of National Advisory Council for Aeronautics, and 52 representatives of the NATO research group.



Front Line Express

Close Assault Transports are designed especially to meet the existing requirements of the Air Force and Army.

No other planes are capable of delivering vehicles, weapons and troops to forward combat areas by landing — or evacuating casualties from foxholes direct to rear area hospitals.

ARTTC — truly the front line express.



AVIATION CALENDAR

- Jan. 25-30-Symposium on Industrial Application of Aeronautic Computing Equipment, sponsored by National Research Institute, Hotel President, Kansas City, Mo.
- Jan. 31-36-Annual meeting and engineering display of Society of Automotive Engineers, Sheraton Cadillac Hotel, Detroit.
- Jan. 14-16-AIEE IRE NGS Conference on High Frequency Measurements, Statler Hotel, Washington, D. C.
- Jan. 28-30-1948 Elmer Cootner Spray Operation Training School, University of Illinois, Urbana, Ill.
- Jan. 19-25-First Maintenance Conference, Fisher Auditorium, Cleveland, O.
- Jan. 13-25-Motor ground meeting of the American Institute of Electrical Engineers, Hotel Astor, New York, N. Y.
- Jan. 26-29-21st Annual Meeting of Institute of Aeronautical Sciences, Hotel Astor, N. Y. Hours Night classes Jan. 28.
- Feb. 12-13-National Aviation Education Council annual meeting, Atlantic City, N. J.
- Feb. 18-New York Section of the Instrument Society of America, Hotel Statler, New York, N. Y.
- Feb. 18-19-1948th Annual conference of the Society of the Physics Institute, Ross Hotel, Physics Institute, Washington, D. C.
- Mar. 16-18-Research Annual Conference, Society of the Physics Institute Canada, Inc., General Beach Hotel, Niagara Falls, Canada.
- Mar. 22-27-National Production Forum of the SAE, Hotel Statler, Cleveland, O.
- Mar. 31-Apr. 2-First International Magnetron Exposition, National Guard Armory, Washington, D. C.
- Apr. 4-10-Second Annual International Machine Spinning Show, Grand Central Palace, New York, N. Y.
- Apr. 20-25-Aeronautic Production Forum, National Aeronautic Meeting and Aircraft Engineering Display (NAE), Hotel Governor Clinton and Hotel Statler, New York, N. Y.
- May 11-15-IRE National Conference on Airborne Electronics, Dayton Elmer Hotel, Dayton, O.
- May 22-25-1948 National Materials Display Exposition, Convention Hall, Philadelphia.
- June 9-11-Second International Airframe Trade Show, Hotel Statler, New York, N. Y.
- Sept. 5-15-1948 SBAC Convention Year Flying Display, Farnborough, Hampshire.
- Sept. 14-17-Fourth Anglo-American Aeronautical Conference, London.
- Oct. 18-International Air Fair, England to Chateaufort, N. Z., entry deadline Jan. 31.

PICTURE CREDITS

- 5—(top two) Courtesy Chesapeake Water World; 14—Water World; 15—Farnborough; 16—Water World; 17—Farnborough; 18—Kearney; 19—Courtesy Water World; 20—Bullman Edwards; 21—Bullman Edwards; 22—U.S. Navy; 23—U.S. Navy.



SEA TRIALS FOR CONVAIR SEA DART—Raiding new Corsair XP1Y-1 Sea Dart deftly wing flying last fighter, world's first, is seen in photos above and below undergoing two trials in San Diego Bay. Shortly visible under forward fuselage is craft's novel hydro-dia landing gear. Note how spray jet issues engine intakes behind cockpit canopy, while XP1Y-1 planes on its hydro-dia at high speed.



Navy's Latest Jet Planes Begin Tests

XP1Y-1 DETAILS—Wings barely above water, the Sea Dart tests shock on the bay, permitting a close look at its configuration. Power plants in the prototype are two Westinghouse J46s. More powerful Westinghouse J46s are scheduled to be fitted later. Navy has ordered a dozen XP1Y-1s in addition to two prototypes. Cost will be approximately \$2,150,000 each. (Also see Aviation Week Dec. 8, p. 15.)

DOUGLAS KAIB-1 ALIGHT—By new Navy attack bomber (below) in flight. The new replacement deep creep of the wings. Toward attack, under the wings is built on Westinghouse J46. USAF version will be the KB-66. Production line are being rushed at Douglas, El Segundo, Calif. A twin 28-inch diameter turbo-propeller is fitted on the KB-66's tail.



Boeing B-52



jet power packages by

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OF READY-TO-INSTALL POWER PACKAGES FOR AIRPLANES

ROHR
AIRCRAFT CORPORATION

CHULA VISTA AND RIVERSIDE, CALIFORNIA

WHO'S WHERE

AIA Elections

Stanley J. Fels, president of Republic Aviation Corp., Farmingdale, L. I., N. Y. has been elected chairman of the board of governors of the AIA. Fels has been in the first half of 1973. Nominated chairman for the second half is Oliver P. Kelen, chair man of the board of Northrup Aircraft Inc., Hawthorne, Calif.

Arlo DeWitt C. Ramsey, USN (Ret.), has been elected AIA president for 1973. Nominated in the normal succession to him, after DeWitt C. Ramsey, is **Frank C. Carver,** president of Thompson Products Inc., and **Isa C. Eiken,** Hughes Aircraft Co. vice president.

L. D. Webb was elected vice president and Western Region general manager and **Harvey Brand,** Jr. was reelected secretary-treasurer.

Changes

Bob Cox Henry C. Knutson, President of American World Airways, announced, has been notified to active duty with USAF for 60 days. He will head a transport squadron presently on active duty.

Paul S. Baker, engineering manager for Chance-Vought Aircraft, Elgin, Ill., is leaving the firm at the end of 1973. His former plant has not been announced.

W. G. Smith has been named assistant sales manager of Piper Aircraft Corp., Lock Haven, Pa.

Leon W. Stone has been designated supervisor of field service and training section at Wright Associates, Dayton, Ohio. **Carl Wright-Cook,** Corp., Wood Ridge, N. J. **Walter Van Doren** has been appointed to position of the commercial sales section, **Bernard M. McPeak** has been named assistant manager of the Space Parts Division, and **Kenneth K. Williams** has been given the post of the customer consultation section. **George W. Moore** has been designated sales manager of Electronics Division, **Continental Corp.**

W. Shum has joined the **Northland Electronics**, England, to handle worldwide sales with sales assistance.

Harry E. Steiner has been transferred to the **General Electric** division of **General Aircraft Co.** as a member of the sales department.

William Paul Patton has joined **Parabellum Airlines Corp., Los Angeles** as controller. **Bernard Goldman** has joined **Paul Dineen** and Co. as senior technical writer in the publications department.

Elected to the Board

John F. Bennett, president of **Northrup Defense Products Corp.,** has been elected a director of **Trans World Airlines** in 82 the director named by the death of the late **William S. Talbot.**

William A. Mahley, Dallas attorney and insurance company board chairman, has been elected a director of **Boeing International Airways.**

INDUSTRY OBSERVER

►Washington is hearing with rumors of a substantial presidential cut in the fiscal 1974 budget submitted by Department of Defense. Some estimates place the President's cut as high as \$2 billion.

►Navy has confirmed that **Grumman F9F-5 Phantom** are in action over Korea. The latest model Phantom powered by the P400A jet engine, recently shot down a pair of **McG-45s** from a formation attacking **T-28s** in the Sea of Japan.

►Indications are that the first **Grumman** overwing **Cougar** (F9F-6) powered by the 2,300-hp thrust version of the J45 will be on the way to Korea. The Cougar uses a "strong wing" similar to low-back, controlled horizontal fin in the F9B. It is expected to have a tactical speed.

►Allison Division of **General Motors Corp.** reports its **Turbo-Laser** powered by T36 turboprop has logged 175 flights totaling more than 160 hours.

►Anson Division of **General Aircraft & Film Corp.** has developed an automatic pilot and made initial flight tests in a **Piper Pacer** under CAA supervision. Anson expects to meet its target price of a price of about \$1,000, considerably lower than its nearest competitor.

►Watch for **Kellett Aircraft Corp., Cananda, N. J.** to make a comeback in rotarywing aircraft. Kellett is reported to have joined its bankruptcy debts and is now at work with a staff of 250 people on military police and subcontracts, all in the helicopter field. The corporation also is working on new, advanced rotarywing designs.

►Raytheon Metals recently developed an 18 ft helicopter rotor blade made by an aluminum extrusion process. Price for the new blade in quantity production will be about \$55.

►USAF has completed its three overhaul and modification overhauls with **Boeing Aircraft Co.** of **Boeing, Wash., D.C.** and **Boeing** has completed its first contract that permits USAF to add to the **Boeing** has workload. Under the new contract USAF has management services or **Boeing** for the entire **Boeing** system and can schedule additional work on new type aircraft as required.

►Shaw S-35 variable-sweeping research type in the lineage of a British fighter type that probably will be built by **English Electric**, maker of the Canberra bomber. Other variants of the S-35 may appear during the research process.

►Thompson Products will operate a new jet engine test facility for Navy at **Pulaski, Ohio**, northeast of **Cleveland**. Construction will be financed by Navy. Purpose of the new job is to test jet engine components developed by private contractors. Cost is estimated at about \$1 million.

►Cessna Aircraft is studying a two-door kit for attachment to its 1973 Model 170 four-seater to enhance its sales appeal for the firm market. The kit would feature detachable seats suspended under each wing equipped with waist-mounted fins to control the opening or closing mechanism. Slow response to the speed of the Model 170, aided by large flaps, would help opening operations.

►Swedish Air Force has signed a license agreement to build **Boeing** Korea **Avion** jets for its **Su-32** high-speed attack plane. This indicates the Swedish are expanding their export efforts to build their own jet engine industry by utilizing Swedish engineering ability rather than relying on foreign designs.

►McDonnell Aircraft's F-100 long-range USAF fighters will have the **Port & Whitney J77** in its production models.

Wait-and-See Period

These developments in Washington, now, in the fall drama of the "wait-and-see" period before the new Air Materiel Administration takes over, give some indication of what's to come.

President Truman is putting on the spot Republican congressmen who might have a say to cut sharply into the defense budget he will submit to Congress before leaving office. The defense budget is expected to total between \$39 and \$41 billion compared with this year's \$46 billion, and will amount \$16.4 billion for the Air Force, compared with this year's \$20 billion.

The outgoing President's remarks, indicating Democratic plans to reduce defense a top political issue.

"Our present defense mobilization program does not cover approach the limit of what our country could do if we had to."

"Nevertheless, there has been a great deal of talk about the country's unutilized capacity to produce a defense program of the magnitude of this one. That is a very dangerous idea, because it could conceivably lead this country to a decision to cut back the defense program to a point below the minimum levels of our national security."

"This would happen at a time when we are confronted by a potential enemy that is very hostile and very powerful. And that potential enemy is getting in a greater proportion of his national product into the building of military strength, year after year, than we are."

"The people are wise enough to know the difference between free economy and false economy. They are wise enough to know that anything that may be spent to prevent a new world war is bound to be far less than would be spent to fight one. The people are also wise enough to know that we can afford to pay the cost of whatever is necessary to prevent a new world war. We can afford to complete our defense buildup. We can afford the cost of maintaining our mobilization here in peacetime for our emergency."

Defense Leadership

Defense leadership in the Eisenhower Administration will meet the occasional complaint of aircraft manufacturers to the Senate Appropriations Subcommittee that the Defense Department now "lacks the line of personnel and production. It is composed of too many bankers and lawyers."

Eisenhower's designees for Defense Secretary and Undersecretary and Secretary of Air and Air Force are big production men, and Navy Secretary designate Robert Anderson has had extensive business experience.

Prospect of a wholesale no-holds-bar defense offensive on Jan. 15 is causing considerable concern. Some arrangements to keep on certain key men, such as Assistant Secretary for Air John H. Tamm and Air Force's Undersecretary Russell G. Carlson, is expected. New appointments will be hard to get either to support or oppose reports of the 1953 fiscal year defense budget. Congressional budget hearings start early in February.

Defense Secretary Robert Lovett's line tactics toward USAF and Navy aircraft programs may have been somewhat pardonable by knowledge that House Armed Services Committee is sitting on a report largely criticizing the services for leaving obsolescence programs. Authority for Lovett's action directing cutbacks of old models stems

from the previous meeting into the current year Defense Appropriation Act giving him complete control over early production and procurement. It opens next July 1. There may be a fight over removal but the heavy odds are the industry will be removed by Congress.

Smoking out intramural no-holds-bar, which flooded into open briefs with USAF Undersecretary Russell G. Carlson's complaint that in addition to Air Force there are three other buildings at Fort Belvoir, Army and Navy and Marine, is leading the already strong sentiment in Congress to give more authority to Defense Department's top command to direct some of our policies and equipment.

Now Air Force Secretary's membership to a key defense policy job under the Eisenhower Administration is hoped for by Navy leaders. They say he will join high with the President's Chief of Staff in his new position as the Navy's 1949 attack on the B-36 strategy on jet power. Realized as disrupted by the Pacific following the open light before House Armed Services Committee.

Gen. Benjamin Chittenden, now head of Air Defense Command leads in Air Force participation in a mission to Gen. Hap Arnold, who is in charge of the staff in April. USAF now report that President's Chief Executive's study has indicated he wants Lt. Gen. James H. Doolittle to continue service with NATO, with which he has been connected since its start.

Legion Service

American Legion, which has pressed Congress for universal military training since the end of World War II, is waiting to a campaign for a strong Air Force. Spokesman of the movement, Col. Robert Farnsworth, now vice president of National Aeronautics Association, as well as its active Legion member.

Civil Aviation

Commerce Department is expected to have weak aviation leadership under the new Administration. Robert H. Ransdell, designated to become Undersecretary for Transportation, is the only member of the top command with any aviation or transportation background. He served in the Air Force during the war, receiving the rank of colonel. Secretary designate William W. Wirtz and Undersecretary designate Walter Williams haven't that much experience with air or transportation. Now head of the Pennsylvania Economy League, a privately financed organization to promote economic development, Murphy probably will apply himself to concentrating in CAA.

Naturally, members of Air Corps Transport Association, now forming a legislative committee to push for a revamp of the 1938 CAA Act to give the organization a new mission. The committee also will launch a more aggressive fight on scheduled airlines.

Management Shakeups?

There is talk in aviation circles of:

- A possible shakeup of United Air Lines management, with replacement of the leadership of President W. A. Patterson at once.
- A possible shakeup of Pan American and Airline Co. management with Richard B. Smith, president, in the same center.

—Katherine Johnson

Services Blueprint Dual-Economy Plants

• Production Acceleration Insurance Program will assure rapid conversion to "total war" output.

• Funds will be asked to provide 200 aircraft firms with specially high-volume standby tooling.

By Robert E. Hays

U. S. Air Force will request funds in its fiscal 1954 budget to begin financing a program to provide the aircraft industry with special high-volume machine tools and production equipment in case of its need for rapid expansion.

This request is part of a joint USAF-Navy Bureau of Aeronautics program known as PAID—Production Acceleration Insurance Program. Navy's Fowler already has received appropriations totaling slightly more than \$1 billion for this program since fiscal 1951. The USAF program eventually is expected to be comparable. Navy already has allocated most of its PAID funds and expects to have most of its authorized available facilities ready by the end of 1953.

PAID is to create enough standby production capacity within the present framework of the industry to make possible a quick acceleration from present production levels to the requirements of all-out mobilization. PAID is concentrated on certain key industries such as airlines, engines, avionics equipment, guns and bomb-making materials.

USAF and the Navy are in effect planning to spend money now to create the standby production capacity as insurance against hitherto development of what was a jump to all-out mobilization capacity.

PAID actually was authorized by the Department of Defense and the Office of Defense Mobilization. Both agencies indicated they would support the request for PAID funds from Congress. Machine tools and production equipment for the program will be developed only after all requirements for current production needs are fulfilled. Then the backlog of PAID tool orders will be the backlog tool orders for production for the current aircraft programs begins to decline.

Five firms—Anson 200 firms are included in the USAF portion of PAID. Each firm selected by USAF has done its own planning of what it needs to

meet actual mobilization needs. Each firm currently participating in PAID also is responsible for planning the mobilization requirements for all of its key subcontractors.

Prime contractors who will order and distribute to their subcontractors machine tools and production equipment are alerted that under PAID. After USAF approved the firm's plan, it will authorize purchase of whatever equipment is needed. By placing the machine tools and production equipment in the plants where they eventually will be used either in strong efforts to run down after World War II, USAF expects to save considerable time in getting the machines into production.

Firm which has a government part of the aircraft industry, PAID will mean purchase of expensive, high-volume tooling instead of the less costly required by its current production plans. For example, substitute "special" will be provided instead of subcontractors in general purpose tooling. More expensive long-life tools will be used instead of cheap types that would be sufficient for current runs.

Firm which has no government part of its business can obtain credit to produce production PAID as well as providing a greater degree of flexibility in making the shift and an easier method of producing for both parts of the mobilization plan.

Participating PAID programs are expected the U. S. will need to sustain the present dual type economy for the foreseeable future and it will be necessary to sustain the industry production capacity of first normal, could shift their emphasis to civilian production as military demands diminished. There is a considerable variety of methods by which these dual type firms will participate in the PAID program. These include:

• The dual-purpose-type plant, housing both military and civilian production under the same roof. This is perhaps the least likely type and is a part of the new Defense Secretary, Charles

E. Wilson. USAF has one of this type plant now operating at Kansas City, where F-84 aircraft and General Motors cars are being assembled in the same plant. A Navy dual-purpose type plant at Arlington, Texas, has been withdrawn from annual production.

In a dual-purpose plant the tools, machinery, for current military production will be set up in "cold" lines which are used for planning the operation of these facilities, open, as the stand when they can be moved easily to replace civilian machinery as the need arises.

Production plant under separate roofs. This involves construction of a military plant into a civilian plant so labor can be divided only from one activity to another. The military plant can be maintained on a standby basis with other civilian production facilities from a "warm" line to maintain a nucleus of experienced personnel and additional "cold" lines set up for use when actual production is required.

Production production by branches of power, aircraft construction at an extremely low rate just sufficient to keep up with engineering changes on the line product with sufficient maintenance and repair required to shift to volume production whenever necessary.

Production production line set up for aircraft mobilization around a core of civilian production units. Some contractors also are considering this type plant for storage of aircraft tools where they do not have sufficient space now available actually to set up a "cold" amount here. All of the various PAID participation methods are covered in providing a contract with the tools and production equipment, factory space and labor that will need to meet the mobilization requirements.

There will be some loss of production equipment due to obsolescence in mobilization goals shift to newer aircraft and equipment models. PAID requirements are aimed at providing a maximum of flexibility in its tool and production equipment. The program will be augmented as necessary to meet reduced requirements in the aircraft industry.

The program is simply insurance against being caught short again in a national emergency, as we were when the Korean war began, "our PAID plan" explained. "We are spending these funds to have time if and when we have to speed up to all-out mobilization."

CAA Says Radar Needs 'Saucer' Filter

Saucerlike radar returns detected on scopes by helicopters and at atmospheric transponder receivers may require a new radar scanner enabling air traffic controllers to spot the difference, a Civil Aeronautics Administration report says.

The technical report, compiled by R. C. Braden and T. K. Vickers of the Helicopter Technical Development Center, says "wing vortices" observed as "baffle" control radar last summer were "simply erroneous reflections of the radar beam related reflecting areas in the transponder receiver field."

Observance of unmodeled saucer targets on radar scopes is neither new nor unusual, the CAA report noted, but before the "flying saucer" was there were called "ghosts, puffs or ripples." Correlation of radar observations with the U.S. Weather Bureau records indicate that a nonspurious saucer-shaped shadow was noted when wind gusts appeared on the scope.

Further Reflections—The report also refers to the tracking and subsequent correlation analysis of 30 targets of this type indicated that a large number of these targets were actually atmospheric reflections of the radar beam, (the report said). "Apparently these reflections were produced by isolated reflecting areas, which traveled with the wind as it was the temperature inversion layer."

"Although the exact size and composition of these isolated areas is not known, it is believed that they may be atmospheric eddies produced by a clearing action of dissimilar air stress. It appears possible that such eddies are reflected and form the radar energy with a lens effect to produce small concentrations of ground return with sufficient concentration to show up on the radar display."

"Radar targets of this type are usually new to recognize because of their generally weak returns and slow ground speed. Unfortunately, false returns from wind-blown helicopters are also seen the same characteristic. Spurious targets of this type can become a nuisance under busy traffic conditions, particularly where helicopters are prevalent."

►Weather Cause—The report noted that during last summer's heat wave the weather in the Washington area was characterized by a high pressure area with resultant lack of cloud cover. The conditions presented a perfect recipe for the eddy and rapid radiation cooling of the surface at night. The combination strongly resulted in inversions of temperature sometimes during hours of darkness.

In addition to the Washington sight-



AFT SECTION of crashed C-124 involved in previous crash, contained most survivors.

Four Generals Probe C-124 Crash

USAF assigned four generals, including its top-ranking safety man, to lead a full-scale probe into the cause of the crash of a Douglas C-124A Globemaster II shortly after dawn last week at an Air Force base in Laos.

The crash, Dec. 23, with loss of 88 soldiers personnel.

Base officers speculated that the plane may have been buffeted into the air before it attained sufficient flying speed. It seemed to stagger up to approximately 130 ft. altitude, then stalled and fell to the ground about two miles from impact.

The crash toll now believed to be the largest in a single plane crash in aviation history.

Heading the Air Force investigation team: Maj. Gen. V. E. Bertinelli, deputy assistant general for flight safety, and Brig. Gen. Robert J. ...

...

...

... it will increase the risk in being crash

O'Keefe, director of flight safety research, both of Norton AFB, Calif.

One crew member, 43-year-old Joseph Skarnitz, assigned as command post operator, was thrown clear of the plane into a mudbank, and suffered an arm injury. Most of the other 29 survivors were in the tail section of the plane, which was torn loose from the forward fuselage. The weather reported "no record" to be being poor.

Plans for starting the flight AFR, 101, with stops on route scheduled at San Antonio, San Antonio AFB, Texas, and Douglas AFB, S. C.

Other high-ranking participants in the investigation were Maj. Gen. R. W. Douglas, commander of the 119th Air Force, to which the plane was attached, and Maj. Gen. H. L. Stinson, deputy commander of Tactical Air Command.

After World War II, instead of being sent to Japan, the plane was sent to the Philippines. With a new line period of 1947-49 total of 100, the plane figure will be around 115 instead of 70, where it now stands upon the old figure.

►The "saucer" incident has been changed. RLS will place things it never calculated before, such as the cost of home ownership, home maintenance and so on. It will now give a 48, instead of 34, extra and will include some modern and small items. And it will change—according to recent changes in family spending habits—the importance of various expenditures in the total cost of the unit.

►Strander Index—RSL. The index will not fluctuate as much as it has in the past. Aircraft evaluator classes usually provide for an adjustment of one cent an hour for every 14-point change in the index. Cost of living is going to have

to fluctuate almost twice as much, per centage, to cause the new index to rise 1.14 points.

How to reflect the change in the calculator formula will be the subject of later management negotiations. Index tables, in contrast, will also have to be revised to accommodate the new and lower index figures.

RLS is dropping the old index in December. The January index will not be announced until February. The three who need to work to the old plan are from 1955-59, RLS also will publish during 1955 the new index with that base. This will allow more time to shift to the younger base. But the "saucer" incident of goods and services being passed will be the new not the old.

Ford Gets Contract Increase for J57s

Air Force recently awarded a \$10 million contract with the Ford Aircraft Engine Division for manufacture of Pratt & Whitney J57 turbojet engines. The amount totals to \$97 million, with Ford having already received \$87 million for the contract.

John DeLoria, vice president of Ford's Mechanical Products Group, said the first turbojet engines are scheduled for February 1956. AF engine schedules at the Chicago plant run through the first half of 1955, DeLoria said, and the company is planning production "to beyond that date."

Ford's initial production of 100 J57s will be for the B-36. C-124 and C-127 will continue to install monthly, according to a peak output rate of 100 per month.

More than 500 engines being used in various engine production, about half the total requirement for the pilot line will be converted later for turbojet output. Ford has ordered more than 200 new machines to do its job last year, 124 additional machines are on order for plants supplying 175 parts and sub-assemblies.

Britannia Cargo Plans

(McGraw-Hill World News)

London—British Overseas Airways Corp. says it will begin using the new supersonic jetliner Britannia in a transoceanic freight cargo transport.

A BOAC spokesman said the airline's two Britannias on order will provide "the highest standards of speed, freight transport on a world-wide scale." Strömberg, chairman of the BOAC board, said the airline also had to expand the Britannia and Comet 1, 2 and 3 to ensure passenger appeal and competitive operation against what he considered the best of the first production

Wright Memorial Observances

Truman presents trophies; urges continued air power buildup; ASA wants more research and planning.

Katy Hawk, N. C.—Three North American F-100 Super Sabres were presented to the Air Force by the Air Force last week, during the 49th anniversary observance of powered flight.

The high-speed jets stood over at 47,000 ft. into a dense cloud layer at the base, and landed on the runway. The jets were then taken to the runway, down on the ground at the base of the plane, and were then taken to the runway, down on the ground at the base of the plane, and were then taken to the runway, down on the ground at the base of the plane.

Truman presented trophies to the Air Force last week, during the 49th anniversary observance of powered flight.

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Four different E-121 Canberra bombers were lined up at the company's field at Wright, Kansas. From front to back, the four are: 1. A Canberra bomber, 2. A Canberra bomber, 3. A Canberra bomber, 4. A Canberra bomber.

of flight by paying their dues in a ceremonial and by using the Katy Hawk again with its modified hull and constant speed as a full-scale actual observance for light research.

►Truman Presents Trophies—In Washington, President Truman gave the principal address at the Air Force's annual Wright Memorial observance, the 49th anniversary of the Wright T-3, the Col. has Trophy and the Brewster Trophy. It was the first time in present memory that a President has participated personally in the Wright observance.

Mr. Truman said that the U. S. continues to build up its air power and continue to make the most effective use of its resources in keeping the peace.

At the base of the observance, the Wright Memorial observance, the 49th anniversary of the Wright T-3, the Col. has Trophy and the Brewster Trophy. It was the first time in present memory that a President has participated personally in the Wright observance.

John Stroh, assistant director of NASA's Langley Laboratory, received the Collier Trophy, and Maj. Gen. Louis W. Blum, Civil Air Patrol commander, received the Brewster Trophy for contributions to aviation education.

In Dayton, the Wright anniversary observance was highlighted by the appearance of Maj. Charles Wright, first USAF pilot to fly faster than sound (Aviation Week Dec. 22, 1947), and Capt. J. Wade Smith, who recently set the new world's speed record of 689.9 mph, reported to be confirmed soon as a historical record.



Harold E. Talbott
Secretary of the Air Force



Roger M. Kyes
Deputy Secretary of Defense



Robert B. Anderson
Secretary of the Navy



Robert T. Brooks, Sr.
Secretary of the Army

Talbott Named AF Secretary

But there still is much speculation on who will be in lower echelons of the Defense Department under GOP.

Speculation is building up over how long the current undersecretaries and assistant secretaries will stay in the Defense Department, Air Force, and Navy after the Eisenhower Administration takes over Jan. 20.

The question was raised at the first press briefings after the official announcement confirming Harold E. Talbott, New York, subindustrials, as Air Force Secretary (on leave) in January, Week Dec. 15) and naming those three other men to top government defense posts.

• Roger M. Kyes, 45, General Motors executive, as Deputy Secretary of Defense under Defense Secretary Charles E. Wilson, former president of General Motors.

• Robert B. Anderson, Texas oil man and truck manager, as Secretary of the Navy.

• Robert T. Brooks, Sr., New Jersey textile executive and director of General Electric and General Foods, as Secretary of the Army.

Kyes, GM vice president and general manager of its Truck and Coach

division since 1950, is described in an executive division order as "a company man and is expected to carry a heavy load as the operational level for WPA."

With General Eisenhower's campaign promise to provide more defense action through better management, the new industrial management team has a big governmental "red tape" cutting assignment for itself. Kyes is expected to wield the scissors.

Anderson's deep desire of his status for the Army Quartermaster Corps in World War II and was a Team Captain for Eisenhower's.

Stevens has been director of the Federal Reserve Bank at New York. He served as a Field Artillery lieutenant in World War I and a colonel in Army command in World War II. Talbott was director of aircraft production for the War Production Board in World War II (Overseas Week Dec. 15, p. 14).

All five of the new defense appointees met in Washington last week with their counterparts in the Truman Administration for a policy briefing.

Meanwhile, John A. McCone, former Undersecretary of the Air Force, continues to be considered as a possible Defense Department appointee. He has been removed as a likely candidate for an Assistant Defense Secretary post or assistant to Undersecretary of the Air Force, possibly with an agreement that he will succeed Talbott at a later date. Another speculation is that he might succeed to the Assistant Board staff membership.

Among the present second level defense executives likely to stay on the job, according to Foreign Broadcasts, are Russell L. Gibson, Air Force Undersecretary, and John J. Fillingim, Navy Assistant Secretary for Air. They may be retained because of their familiarity with their respective air procurement programs. Assistant Secretary of Defense (comptroller) William C. McNair, head of the department's Fiscal Department, also is expected to stay on for an indefinite period.

Japs Seek Contract

(McGraw-Hill World News)

Tokyo—Four Japanese former industrial consultants are negotiating with the East Air Force to handle release and maintenance of ex planes. They are Mitsubishi, Kawasaki, Shin Meiwa and Fuji.

If the deal goes through, it could be the initial step in opening the aviation firms. It would be necessary to release some Japanese airport and maintenance facilities now being used by FEAF. Financial aid also would be needed.

How Much Air Power for Japan?

USAF says Japan should have independent air force of jet interceptors; Army wants tactical group.

By R. P. (Peggy) Martin

(McGraw-Hill World News)

Tokyo—The U. S. Army and the Air Force in Japan are locked in a bitter struggle over what type of air force Japan should have when it starts. The dispute, reminiscent of inter-service battles once fought in Washington, encompasses these views:

• Gen. Mark Clark, the East Command headquarters already is building the foundations for a tactical air force to be controlled by the future Japanese army.

• The U. S. Air Force, which has been shut out of its large share from the planning stages of Japanese reconstruction, now demands that as a dependent air force be set up strong jet interception.

• Japanese defense leaders who are beginning to have a strong voice in their country's military plans, generally support USAF views, but want a much larger air force than most Americans believe commercially or strategically desirable.

• The Basic Objective—There is little or no conflict between Army and Air Force over the basic U. S. objective: a new Japanese army, navy and air force capable of defending the home islands. This is part of the broad U. S. strategic policy of making free Asian countries strong enough to protect themselves from both internal subversion and external pressure, a sort of "body-lash" defense against to contain Communist China. Ultimate hope is to run the show on U. S. equipment and without potential by using Asians to defend Asian territory against Communism.

The dispute in Japan represents a bitter conflict among Americans and Japanese military leaders over this country's defense requirements and a lack of official U. S. policy. Gen. Clark's Strategic Advisory Section, responsible for the American side of the post planning, is made up exclusively of Army officers. Even the Air Advisor is an infantryman. Their conviction is that Japan should be developed to be a light ground force supported mainly by the U. S. Air Force. If and when a Japanese air force is developed, according to their opinion, it would consist almost entirely of fighter bombers to close support under Japanese army control.

Japanese military experts strongly oppose this concept. They insist that Japan's defense is inseparable from the sea and

naval problems of sustaining strategic air bombardment and mobile blockade. "I would, highly unlikely army of possibly 10 divisions in all that would be needed to protect the home islands from aerial invasion, they say. The Japanese can put their country's position with that of Great Britain. Thus as that air force battle of Japan will be fought in the Battle of Britain—in the air."

• Proof for USAF—Most Japanese believed American policy was to deny them air force. They did not pass their arguments about air power through its meetings with Clark's advisory staff. Recently, however, Gen. Charles Russell, chief of intelligence, the East Air Force, organized a group of parliament officers and suggested Japan should be thinking about the problem of air force.

• Budget's needs collected for East Air Force's mounting claims over the need in military planning for Japan. The National Safety Corps, through the National Police Reserve, has an air force limited to liaison, reconnaissance and artillery spotting. Pilots and maintenance men are being trained at its main base, Misawa (prefecture). The force will consist of approximately 120 light planes probably between 1.36 and 1.57.

Recent Tokyo Airport Co signed a contract with Lockheed Aircraft Corp., Pasadena, Calif., to produce the F105. The Japanese did not intend to develop their own aircraft. The Defender, which will be the first plane to be produced in postwar Japan, according to an

unofficial source, is to be sold to the Government of Japan in Asia. But Clark's headquarters hopes to produce the plane for Japan's new army.

• Air Force officers began to see the clear outlines of what they greatly regret to see in the new policy regarding air force. They insisted that Gen. Clark was a leading exponent in the U. S. of Air Force controlled tactical air power. Clark took that fight. Now, according to Air Force officers, he is greatly disappointed to apply in Japan the ideas that was rejected in the United States. Air Force officers believe, it would be a waste of expense and a repetition of the old practice method of dividing Japan, which is to create an independent air force built around an extensive command.

• Key Dispute—Once the dispute between the Air Force and the Army came into the open, and the Japanese realized this would be permitted to have an air force, these planners went to work. Japan's National Safety Board, which might be compared to the U. S. Department of Defense, prepared a report of what was wanted.

- 53 fighter groups of 994 jet planes
- 16 light bomber groups of 250 planes
- 75 transport groups of 175 planes
- 13 patrol and reconnaissance groups of 224 aircraft
- 4 groups of 16 light flying boats
- 16 training groups of 250 aircraft

Estimated cost was enormous, about 300 billion yen (350 billion dollars for the first year of 1950, 120 billion yen (150 billion dollars) would be used to produce aircraft. Maintenance costs would be approximately 200 billion yen (250 billion dollars) a year. The Japanese did not intend to develop their own aircraft. The Defender, which will be the first plane to be produced in postwar Japan, according to an



FARMER'S HELPER

Dept. PA-15A agricultural lightplane is seen dropping a high-density spray from its 100-gallon boom suspended beneath the wings. The boom can put out up to 15 gal. rates in a 34-ft. swath or 10 gal./foot in

a 50-ft. width. The new high volume equipment has been especially valuable in spraying alfalfa and Colorado potato crops, allowing much lighter to reach the lower buds and including overhead spraying.

reversal of Japan's aircraft industry and pay a substantial share of the annual cost of maintenance.

• **USAF Resumes Air Force efforts** were attacked at the start of this program. Unofficially they whittled down the estimates, substantially reducing the size of the plant and reconnaissance force, and mutually obscuring losses. They also outlined a modest program to build on air force from the ground up.

• **First step should be enterprises of Japanese into the Air Defense Force**, now operated solely by Americans. Japs would be given an air job training in order stations maintained by Far East Air Forces in the home islands. As soon as possible, Japanese would take over the entire air warning system.

• A Japanese air staff should be begun and trained to operate and maintain a modern defense air force.

• **Backbone of the air force should be fast to an inspection of jet interceptors**, totaling 100-150 planes. With this nucleus, the Japanese could train, organize and develop the air force to meet changing conditions.

The real heart of the program is reconstruction of Japan's aircraft plants. Far East Air Forces has made the initial move by organizing with Japanese firms for maintenance and overhaul of American aircraft. Next step should be production of lightplanes while obtaining equipment, training men and preparing for eventual production of jet aircraft. It might be five years before jets would be coming off the production line in any substantial numbers.



FRENCH DELTA PROJECT

Here is a snapshot of a magnificent French delta-jet powered aircraft designed by Péguy, who has been responsible for a num-

ber of high-speed aircraft in past years. The craft is shown here, the model company making only a slight touch ahead of the jet.

Japan's peak production during World War II was in 1944 when 28,364 airplanes and 40,844 engines were built. More of the factories were destroyed by air raids and the rest were closed down or dismantled early in the occupation.

Mitsubishi Heavy Industry, which produced 118 bombers, 140 reconnaissance planes, 250 fighters, 20 transports and 1,400 engines a month at its last true peak, claims it has sufficient equipment and enough (500) engineers and specialists to accept Air Force methods on overhaul of any kind. Other firms negotiating with the Air Force are Shin Mitsu Gensetsu Kwanishi (Aichi), Kawasaki Machinery (Mitsubishi Kawasaki Aircraft) and Fuji Industry (for north Nakajima Aircraft).

There is considerable opposition in Japan having any type of air force among those who believe the economy can not be treated. Those opponents including a number of influential Americans, believe the only way to guarantee Japan's continued cooperation with the U. S. is to make this country dependent indefinitely on the U. S. Air Force. Other Americans, and many Japanese believe the cost of building and maintaining an effective modern air force would be prohibitive in view of Japan's limited economic resources.

Tiger Stock Sales Reported to SEC

Sale of 5,200 common and 2,300 preferred shares of Flying Tiger Lines stock

by those of the company's directors is reported in a Security and Exchange Commission survey of transactions by firm officials and major stockholders.

The sales were by James Davidson, director, 3,700 common shares, leaving a total holding of 4,100 shares.

Robert Prescott, president and director, 3,100 common shares, leaving a total holding of 15,328 common shares.

T. J. Sullivan, director, 3,800 common and 2,500 preferred shares, leaving a total holding of 2,992 common shares.

Other transactions reported by SEC: Air Associates, Inc. Sale of 20,714 common shares by Clifford C. O'Brien, director, leaving a holding of 98 common shares.

44-American Airways, Purchase of 100 common shares by Ernest A. Allen, officer, making a total holding of 140.

Boeing Aviation Co. Purchase of 100 common shares by A. P. Larson, officer, making a total holding of 340.

Boeing Aircraft, Sale of 16 common shares by Earl Thompson, director, leaving a holding of 211.

Coca-Cola Bottling Co. Sale of 1,200 common shares by Thomas W. Smith, president and director, leaving a holding of 15,000 common shares.

Continental Airlines, Purchase of 100 common shares by Thomas H. Ryan, director, leaving a total holding of 1,000.

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Faurett Anniversary

(McGraw-Hill World News)

Like, Peru—Thirty years ago Elmer J. Faurett made the first flight from Peru's Pacific Coast over the Andes to the Amazon Basin in a borrowed Cessna Oriole. Up to the end of 1951 his airline, Cia de Aviacion Faurett, had served 686,679 passengers, 82,665,049 lb. of cargo and 3,013,91,949 lb. of mail. Passenger mileage totaled 328,640,520

AMAZON NEWS, December 28, 1952

A New Page in Aviation Progress

The Re-evaluation of Load Ratings for Airframe Control Bearings

The Need.

Because of the tremendous advances made in aircraft design and development, ratings for airframe control bearings (AN 2-14) and methods of selection have been under serious study for several years. This study has been conducted jointly by a group of committees representing the Bureau of Aeronautics, the U.S. Air Force, the Defense Aircraft Standards Committee and the Airframe Bearing Engineers Committee. The purpose of the study has been to develop a method of rating airframe control bearings to more closely simulate conditions encountered in actual flight.

The Present Accepted Method.

Selection of control bearings is made

solely on the basis of the bearing's static "non-Brittle" (KNB) value only — growing completely such factors as normal or combined loads, differences in applications, and cycles of oscillation. This method therefore does not provide an accurate rating of individual bearing capacities.

The New Method.

In determining the new load ratings a criterion other than "non-Brittle" is used. Selecting a bearing by means of the new system involves two basic factors: (1) the radial load load which should be equal to or in excess of basic load; (2) oscillatory rating or fatigue life of the bearing is checked to ensure that the desired average life will be obtained under actual load conditions. This assures

the right bearing for each application with increased efficiency and longer service life, often with savings in weight and cost.

The New Method In Use.

Several designers of current fighter aircraft have adopted the new ratings which permit greater use of standard AN and friction control bearings than under the old "non-Brittle" system.

New Tables Now Available . . .

for load ratings on Fafnir deep-groove radial aircraft control bearings and self-aligning aircraft control bearings based on the new method of computation. Send for complete descriptive material plus tables. The Fafnir Bearing Company, New Britain, Connecticut.

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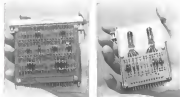


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COMPACT CONSTRUCTION makes digital-type computers look good for airborne use.



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Digital Computer Trend Seen

Versatility, accuracy and productivity give it edge over analog type for fire control and navigation.

By Philip Klaus

A Hughes Aircraft Co. digital computer, developed for an unidentified "airborne control system," may take over a load termed "digitized" air frame guidance, heading, and navigation computers which have previously operated in pure analog fashion. A USAF spokesman says great progress in the digital type

The doctrine that Hughes is working on a digital computer package the first for airborne use, was made in a recent IRF paper by Dr. E. C. Noll one who heads the Hughes Computer Systems dept. It is noteworthy because Hughes builds fire-control systems for the F-3D, F-4C, and F-8 and is developing a new fire-control system for the Convair 1102 and Republic F-105.

Analogue vs. Digital—The terms "analog" and "digital" are somewhat ambiguous inasmuch as a "digital" computer utilizing any and all problems between is a sort of "hybrid" computer operating in "digital fashion."

However, in the terms are usually applied, they imply these general characteristics:

- An analog computer is one which simulates a problem, using electrical potentiometers, resistors, capacitors, etc., as mechanical linkages and joints. By means of these electrical and/or mechanical linkages, the computer can perform directly such operations as addition, subtraction, multiplication, division, differentiation, integration, and trigonometric functions. Analog computer accuracy depends upon the accuracy of its individual components.

- A digital computer works the problem in terms of digits to derive answers, but it is able to perform only addition or subtraction in these digits. By successive additions or subtractions a digital computer is able to multiply or divide by the use of some program, a digital computer can also approximate, with excellent accuracy, other mathematical and trigonometric operations.

- Analog Disadvantages—Although analog-type computers have been widely used in quantity, heading and navigation, they have several fundamental disadvantages:

- Accuracy deterioration. At each stage of solving complex problems, there is a loss of accuracy. An example is a series of operations performed on a slide rule, where each successive calculation compounds the errors of the previous calculations.

- Tied to one task. An analog computer is tailored to its specific problem, heading, or navigation problem. For example, an analog-type computer designed for heading is not well adapted to solving navigation problems and vice versa.

- Accuracy at expense of size. Greatly reducing, greater accuracy is obtainable only by increasing the physical scale factor of the computer which means using larger (and heavier) components.

- Drift due to nonlinearity. An analog computer usually requires often-potential potentiometers, gears, coils, and other mechanical parts which are costly and difficult to manufacture and to replace.

- Digital Advantages—Here's what makes the digital computer look attractive for airborne use:

- No accuracy loss. As long as the computer is functioning properly, there is no loss of accuracy, regardless of the number of operations performed.

- Versatility. A single digital computer can be designed to solve many

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grains and precision, in bombing problems and there is little or no weight or complexity penalty for this added accuracy. A digital computer could, for example, be used for navigation at the start of a flight, later at the deck of a vessel it could be switched to intercept or bombing duties, and still transition to navigation mode.

• **Lower the maintenance.** The digital computer is made up of many identical assemblies (flip-flops, actuators, etc.) which are easier and cheaper to replace than analog assemblies. Digital computer assemblies lend themselves to automatic factory techniques.

• **Personality more reliable.** Except for its "programs" which include the sequence of digital computer operations, and its "memory" which stores data, a digital computer has no moving parts. This makes it potentially more reliable than its analog counterparts. When rugged, long lived transistors can be substituted for the many vacuum tubes now used in digital computers, much of this potential reliability should be realized. (Use of transistors in airborne equipment is presently limited by their sensitivity to impacts at temperatures above 70°C.)

• **Major Disadvantages:** The size and complexity of the programming and data storage (memory) elements appears to be the major handicap in the use of widespread use of airborne digital computers. In ground based digital computers, these elements have been large and bulky. But for airborne applications, where the computer need solve only several types of specified problems it should be possible to reduce the size of these elements.

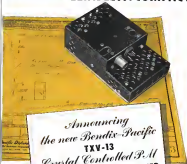
• **Potential:** It is felt by many that the ultimate has previously been reached in the development of analog weather sensors for airborne equipment. Capt. W. H. Korfman of the Wright Air Development Center writes in the



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New threshold accelerometer can measure shock or vibration over the range of 5 to 5,000 cps and can operate over the temperature range of -180 to 700; for mobile and aircraft sensors. Accelerometer is available in three models with output signal problems of 5 to 10 mv. per G, response is flat within $\pm 5\%$ to 5,000 cps. Manufacturer is Teladyn, 100 E. California, Pasadena 1, Calif.

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E: Power Output
Frequency

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In contrast, the exploitation of the digital techniques has not been similarly underlined by data, and its possibilities have not been thoroughly explored by authoritative researchers. "It appears likely that various developments will permit substantial reduction of equipment bulk which remains the most serious problem of digital navigation." With this bulk problem solved, it is almost certain that the digital navigators will secure an advantage position in aircraft applications," Rutherford concludes.

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► **New Core-Stabilized Platform**—Sperry Gyro is developing a gyro stabilized platform in a portable, high accuracy replacement for the separate vertical and horizontal gyro used in aircraft (outboard) installations.

► **Longlife Equipment**—Subcontractors of various standard Hughes electronics equipment, under design by Cornell Aeronautical Lab., are expected to have 5,000 hours life at ambient temperatures of -40 to 125°C.

Equipment will be able to operate at temperatures as high as 250°C, but presumably this would be at the expense of useful life.

► **Gyro Bearings Eliminated**—Aerco says it is producing gyros with out "bearings of any kind," thus eliminating the largest single source of gyro problems or drift error. An Aerco spokesman said his company "had at last passed through the air bearing stage." This principle indicates that Aerco is either using a spinning zero type of gyro developed by Sperry Gyro and discarded several years ago, or is using magnetic gyro suspension.

► **J75 to Use Scintilla Ignition**—Bendix Scintilla is to supply a new high-voltage capacitor discharge-type ignition for General Electric's new J75 turbojet engine.

► **Radiobit Turbo Output Up**—General Electric's production of high-reliability vacuum tubes for avionics and military use is up more than 400% in one year. Called the Five-Six tube, the tube is an outgrowth of GE's radio-bit tube program for Aeronautical Radio Inc. (Aerco).

► **MHI Sets Up Dallas Group**—Alcoa's Hughes Aircraft Co. has moved a 32-man engineering group to Dallas to work with Chance Vought Aircraft "in developing a new automatic control system of a standard turbine," says the CVN's Regular newsletter. The group, headed by John V. Sigford, a MHI auto plant authority, is expected to double in size. Project will require two years for completion. —DK

Guided Missile Programs Offer Challenging Opportunities



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There are general address lists available for your information for information on new or existing aircraft facilities including aircraft design and production data.



SMALL-SIZE TERMINALS

New surface terminals and test-type connectors for small wire sizes (22 to 30) have been announced by Avco-Armstrong Products, Inc.

The company says the new wire terminals are vibration resistant and fast from RF heat. They meet a variety of longer shaver needs in industrial applications. Test-type connectors for joining two wires are a transparent translucent to permit positive inspection. (Avco-Armstrong Products, Inc., 1200 Patton St., Elizabeth, Pa.)

PRODUCTION

Magnesium Gains Favor As Plane Metal

- Industry group hears of production advances.
- Huge cast wing points to new techniques.

By Irving Stone

The second shows that strong, light weight, non-strategic magnesium firmly has established itself as a member of the aircraft family of metals. In a relatively short period, engineers have designed two critical parts of an even wider field of aeronautical applications. The reason is that these are being solved progressively.

The design and production picture showing low-intensive three men have become very broad clearly for a large group of representatives, processors and users of the Magnesium Association's second two-day 5th Annual Meeting in New York.

► **Cast Wing Tied**—One of the highlights indicating expected thinking for application of the metal is a large, and expensive, wing panel now as design stage tests at Wright Air Development Center. It measures 163 ft long, with a maximum width of 41 in.—probably is the largest aircraft surface ever cast.

It was pointed out by an Air Force-sponsored program to explore the possibilities of using the casting technique instead of assembly methods for construction in some, cast and machine. Northrup Aircraft, Inc., designed the structure; Aluminum Co. of America cast it from AZ-62 magnesium alloy, to casting tolerances.

There has been no official designation of the metal for which this type of wing is intended, but reports are that it is being investigated in connection with a guided missile. This could be as large as the Air Force's Convair 440, but reports are that it is being investigated in connection with a guided missile. This could be as large as the Air Force's Convair 440, but reports are that it is being investigated in connection with a guided missile.

► **Aluminum—Wing Shown**—It is a fact that the wing panel shown at the Air Force's Convair 440, but reports are that it is being investigated in connection with a guided missile. This could be as large as the Air Force's Convair 440, but reports are that it is being investigated in connection with a guided missile.



ONE-PIECE MAGNESIUM WING, designed by Northrup and cast by Alcoa under USAF sponsorship, is believed to be the largest aircraft surface ever cast.

As a natural experimental casting, the achievement is important. It is an approach accepted in view of the aircraft industry, but there's no doubt that it will stimulate thinking for other applications, using as a model to demonstrate the versatility of large castings of this type.

► **Recent Applications**—In other large military aircraft applications, magnesium alloys have played an important role. ► **P-40** Capt Dale H. Bluff, of Wright Air Development Center's Aircraft Laboratory, Structural Branch, said

seven of 16 wings constructed for an F4U (Aviation Week, July 4, 1944, p. 25) have accumulated more than 1,000 hr with excellent results. Wing loads were very high, but this was expected. Because of the high speeds involved, practically no joint was left on the leading edge in a matter of a few hours. But new materials, which again appear, are to be used for wing wheels. Fuelage, empennage and flap made of magnesium alloy are to be tested as two F4U's.

► **F4U-2** A. engineering. Convair's F4U-2 wing with an aluminum alloy is also being evaluated (Aviation Week, Sept. 3, p. 21).

► **B-16**, the B-16, magnesium adds up to these weights: aluminum sheet and rivets, 1,468 lb.; engine and component castings, 560 lb.; sheet forgings and castings in miscellaneous component, 200 lb.; rivet castings, 3,710 lb.; miscellaneous, 3,018 lb.; oil tanks, 1,468 lb. Total is 6,570 lb.

► **B-17**, One of the engines on the B-17 is constructed by composition. Appl.

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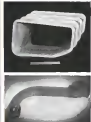
MAGNESIUM castings have been made of ducts (top), wingpans (center) and antenna components (bottom).

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castings on this plane have been restricted conventional to secondary and non-structural parts, involving low stresses, then have required a few. About 570 pounds of magnesium sheet is used in each B-47 fuselage, but little service data is available as yet. In the advanced series B-47, magnesium has been used in the tail thrust structure, instrument panel, engine exhaust casings and control access doors. Some of the metal has been used in skin on bomb-bay door panels. As a result of severe handling, cracks originating at the cover holes developed after short service life.

Other applications in the B-47 include extensive use of magnesium alloys in doglegs and casings in the control system—engine, fuel, transmitter support, elevator air wheel, drive support, radar control pedals, pilot and copilot control wheels. Performance has been satisfactory. Most of these parts are cast and require only a small amount of machining.

► **French Problems**—When previous parts have not been supplied with diffi-

culty have been experienced with fractures on the magnesium—particularly on the B-47 bomb-bay doors. Fractures that are too thick, and other effects of poor workmanship, produced poor adhesion, causing the protective finish to peel in large strips. On the leading edge, the metal has stood up very well under sea stresses so long as the finish remained adherent. But once the finish was broken—usually at riveted butt joints—the sheet would begin to corrode.

Fracture-resistant magnesium parts are not used, but spotwelded components are employed, Capt. Black reports. It has been found that the control of spotwelds in magnesium has been more critical than with aluminum because of the bad effects of excessive spot size.

► **Large Use in Copter**—Probably the greatest application of magnesium—percentage wise in addition to aircraft weight—is in the Sikorski H-19 (S-50). About 17% of the engine's weight—600 pounds of it—is magnesium sheet and wiring.

In addition to fuselage skin, there are 98 AZ-45 castings, the largest weighing 5 lb. Black reports that a switch to AZ-91C alloy is being considered because of the material's superior stress-deformation characteristics.

Other applications in this copter include the gearbox housing, wheels, almost the entire control system and pilot and co-pilot seats.

French counts of Dewa No. 7, a single seat of zinc-chlorine piston, and two spot-casts of liquid. Lay joints are edge-welded before final painting. Zinc-chlorine type is used for corrosion-resistant metal surfaces.

► **In Big Cargo Plane**—The C-124 Chicomoteo uses magnesium parts extensively, Black says. One large zinc component about 2,000 lb. of ZK-50A extruded beam for the main gear door support structure. This application has attracted considerable engineering interest for the plane. Smaller magnesium extrusions are used in the cockpit floor structure.

The large extrusions are not put about in service, with some simple roll supports on hinges and the cutting of web holes for lightning. The only parts added are zinc cargo fastener fittings and washers for attachment of other structural members.

In comparison, a battery beam in aluminum would have required extrusions for top and bottom caps, web and stiffeners. Risky joints and special attention would have had to be given to reduce rolling load concentrations on the cap with the zinc construction. The zinc extrusion beam's web acts as a compression member to transfer these load concentrations without any additional parts.

► **Corrosion Data**—Early in the C-124



WEIGHT-SAVING magnesium castings include leading edge section (right) and part of antenna (center and bottom).

program, zinc corrosion occurred on the beams. As significant as the zinc-chlorine process used as a conductor for electrical action with other metals and the cause after disconnection treatment needed special attention. Also the primer did not offer enough protection without a suitable topcoat. If the liquid, clipped off, the zinc-chlorine is not a very adequate corrosion protection.

Black says a zinc primer coat of vinyl has been developed in great better corrosion protection than the zinc-chlorine and liquid systems used before. Proper staining after disconnection treatment was found necessary, and acids of the zinc water had to be maintained before 6.5 on the pH scale. No corrosion action has been observed since on metal parts in the plant or in service after two years of use.

► **Aviation Floor—Aviation**, decks in the C-124 are fabricated from .457 Dewa No. 7—424 large concentration sheet, and a study is underway to lower this to .4 or .45. The material is cold-formed to 1 in. bend radius.

Some difficulty in manufacturing has been experienced because of surface conditions of the sheet, and a somewhat high reduction in strength requires special care to prevent scratches in handling. Black reports. Service experience with the aviation floor has been good.

► **Aviation Door**—In the C-124's control surface large magnesium and leading edge door hinges. Dewa 01 aluminum hinges are used. Hinges have been used by all leading hinge makers. These and the extruded leading edge have a good two-year service record on the plane seven years as the predecessor C-70.

Magnesium used savings concept 55% of control surface weight and half the weight, but the material is not used where it would be subject to wear that would remove protective finish. Also, the material is not very practical for strong, hence some other method, such as cast steel, is suggested for bearing structure. Special attention is permissible. Black reports, but it is not recommended.

► **Disconnection**—House Service with magnesium in the C-124's water-alcohol tank has not been satisfactory and has been discontinued. The formed magnesium sheet was joined to magnesium casings by welding. The protective coating didn't adhere to the metal and corrosion caused fractures along the edge attachment of casings to the sheet.

Sheet used several positions, says Black, when magnesium fragments were used for hinges on engine and main landing gear doors. But these were changed to aluminum forgings when high deflections were excessive. The magnesium parts had adequate strength but gave excessive deflection.

Attachment of magnesium to steel with 405 aluminum covers, that better than 405 aluminum. With the latter two units, either the hole in the fuselage is painted before installation, Black reports. In some cases the fuselage is installed with wet paint. Big delivery, he says, is expected three times the fuselage diameter, in general. Normal Lockheed maintenance with aluminum fits up to 487 in. have been satisfactory in all of the fuselage.

► **This Welded**—Castings—Castings at least, this welded magnesium and castings were cited by R. H. Gorkin of the R. H. Dehok Mfg. Co., Los Angeles. Highlighting the savings possible with a one-piece casting, the company, Gorkin mentioned an engine exhaust casing in a large duct—284 in. long, 19 in. wide and 14 in. high. The unit weighed 572,100 for production, the casting equipment and the part itself cost \$710. Compared to this, fabrication tooling for the part would cost \$171,100 and the part would

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cost \$1,713. Another cost developed for prototype production is an axle that is 4 in. long, 1 1/2 in. wide, with a shaft hole 1/2 in. in diameter.

►Metal Applications. Casted metal parts being cast by Chokris include a booster stage in 1 1/2 in. long and 2 1/2 in. wide, with internal rib and axial wall thickness varying from 1/2 in. to 1 in. All castings are 13 in. in diameter, of which a large portion is concentrated at the point where the part joins the hub.

Another cast magnesium metal part is a turbine 18 in. long with a diameter of 1 1/2 in. Wall thickness varies from 1 in. down to 1/2 in. Incorporated are an internal and external flange and mounting brackets in integral parts of the unit. Weight is 42 lb., cost is \$830, approximately a lot less than the expense of a comparable fabricated part.

An oversized American magnesium casting for a turbine is known as the "turbohub." This is 42 in. long, 1 1/2 in. wide, but 7 1/2 in. wide. Wall thickness is 1/2 in. Weight is 140 lb. It is finished, then sent to a separate shop for the turbine's landing.

►Acoustic Parts—Chokris is casting the pistons of an airplane motor engine in zinc, eliminating the expense of castings machining. The unit is 15 1/2 in. long, 1 1/2 in. wide with a tapered expansion of 1/2 in. A second type under construction is 4 1/2 in. long, 1 1/2 in. wide with 1/2 in. wall and rib thickness.

Other thin-walled, light-weight magnesium castings made by Chokris are valve assemblies, ranging from straight tubes to double ground heads. All of these are cast with 100 percent, or better, interior finish. Due to a 90 deg. bend, unit weighing 1 lb. is 11 1/2 in. long, 1 1/2 in. wide. Turned ends are cast integrally. Presumably this part was made up into exhaust stack with elements welded in—as an experiment reported to have resulted in 30,000 hours of laboratory simulation in production due to welds not making.

A 40-hp. internal component, 11 1/2 in. long, 1 1/2 in. wide, also makes torque pumps held in an 800-hp. unit. A wing spar, also has been incorporated as part of an axle—in one side the wing, weighing 5 lb. and including a lever, mounting bar on the bracket end. With a wall thickness of 1/2 in., pressure is held to 10,000 psi.

►Wing Parts—Thin-walled wing components being cast in magnesium include a leading edge section and elevator parts. The leading edge casting is 22 in. long, 1 1/2 in. wide, with a 1/2 in. tapered draft. Weight is 7 1/2 lb. After cast in 1 in. thick and has a slot hole 1/2 in. in diameter, steps down to 1/2 in. at the nose section. Its

total rib, 1/2 in. thick, reinforces the section.

An intake section used by Chokris has a wall thickness of 1/2 in. It measures 2 1/2 by 1 1/2 in. and is based with integral ribs. A steel insert for a control is cast as a part of the unit.

Another part in the leading edge of an intake for an advanced jet engine. This unit tapers from a 5/8 in. diameter at one end to 1/2 in. at the other. Length is about 1 1/2 in. The casting is hollow, has rounded ribs, and thickness steps from 1/2 in. to 1/2 in. Ribbons of these parts provide for large attachment. Weight of the casting is only 16 lb.

A drive fly is cast in a 2 1/2 in. by 1 1/2 in. thick. Bolts and large lenses are cast integrally. In the picture is another production drive fly—4 1/2 in. by 1 1/2 in., with ribs and rib thick, even stepping down to 1/2 in.

►Small Castings—Magnesium alloy is also in the permanent casting (lost wax) picture. But according to Arnold Precision Casting Corp.'s chief metallurgist, Paul E. Butler, the demand for an increased magnesium parts has been small. This might be attributed to a situation where magnesium generally has not been specified for the extremely small parts produced by the process.

In addition to parts not in steel and other metals, Arnold in producing magnesium alloy investment castings for engine applications such as fuel and valve system components (parts requiring greater hardness). In various tests, its magnesium alloys are equally capable of resisting mechanical control loads and various transport plane interior fittings. Largest investment casting produced by Arnold in magnesium remains 1 1/2 x 1 1/2 in. This weighs about 1 1/2 lb. and is for a jet fuel injection. Smallest part cast for an aircraft application weighs about 9-1000 gram.

Engineering Schools To Graduate 93,000

An estimated 93,000 engineers will be graduated and available to the machine industry during the next four years, according to figures released by the U. S. Office of Education.

These statistics, recently published in the membership of the Engineering Management Committee, Engineers Joint Council, are based on enrollments for the fall term of 1952. Attention must be concentrated over a number of years have been used to estimate final graduate totals. Figures do not take into account attrition, call-ups, etc.

Here's a year-by-year breakdown:

- 1953—21,000 engineering graduates
- 1954—20,000 graduates
- 1955—22,000 graduates
- 1956—29,000 graduates



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EQUIPMENT

Combat Tire Report From Korea

Number of failures is low, but jet operations from pierced steel planks cause considerable damage.

By R. P. (Peggy) Martin

Today's reports from Korea indicate that types of U.S. aircraft are standing up well in combat. Offices of the Far East Air Logistics Force, however, are reporting that quality has improved considerably in the last few years—"they are much better," says Lt. Col. Robert A. Berner, director of maintenance at FEALF headquarters.

In a recent three-month period, FEALF has received only one Mustang factory Reports (URs) on tires and five on tubes. They are all from fighter units. URs are submitted only if Mustangs believe the maintenance is at fault, equipment failure because of tire and/or tube and tire is not reported.

► **Types of Failures**—The same tire has all these groups:
• Bead failure between tread and cord—5.
• Wire worked out of bead—4.
• Cord development in wing between tread and cord—3.
• However, for no visible cause—2.
(This was interpreted in the field as due to faulty manufacture, although FEALF points out that the tire might have been damaged by a faulty landing on the previous mission.)

None of the tires with beaded blow out. The reason given is that when beaded blow occurred, the tire failed in a localized place or usually was able to retreat and hold. When that occurs there are minimal chances to get wheels up and heading closed. But with this warning of trouble, they try to make their landings in wet-terrain as possible. This sort of landing is believed to have prevented blowouts.

► **Why Failures**—Officials believe that fighter pilots have more sense than do bomber pilots that they fly themselves. They try it to combat psychology. A pilot who has been crashing a MIG or who has been under fire is still living the battle when he gets back. The pilot is close to the ground as a bomber.

He may be over-protective, or may be in landing, and must apply his brakes hard. Or if he goes down, he has no fuel, he won't waste time on his jet. He'll either run a tire than run out of fuel.

Furthermore, the pilot reports from ground-level runways because there is special shafts to meet ground combat

conditions preclude the possibility of constructing permanent, hard surface runways wherever they go. The Air Force carries on a continuous process of snowing and patching the steel planks, but it never gets large gaps with destruction. Main beds pull loose, as the last stages call. Sharp points or cuts may only cut a tire.

To make matters more difficult, most aircraft have the F-4's, F-5's and F-105's, many kinds that nobody would have dreamed possible a few years ago," Lt. Col. Berner points out.

The Far East Air Force has a continuous maintenance program for the pilots to make their "transmission." The flight instructor is rigid. In this theater, beaded blow is damage to a tire product, immediate rejection, because the same tire might be cleared for continued service in the U.S.

Lt. Col. Berner and Maj. Frederick A. Cox, chief of the Unmanned Reports Bureau, Directorate of Maintenance, HQ FEALF, confirm that URs from the field are being reviewed. Since FEALF has no inventory facilities, the reports represent only the selected reports of maintenance men. For that

reason, cases of manufacturers involved are handled from the account.
► **Bead and Compromise**—There have been no URs from beaded blow or cargo transport wings in the last few months. Cox and Berner point out that these wings generally operate from better runways than fighters do, and the failures are almost negligible at related to wear and tear.
Despite "normal" operations at failure, FEALF has not had "any normal trouble" with tires, Berner and Cox say. The latter, about as much as it was discovered that beads on C-46 tires was too loose. But this "epidemic," he others, quickly cleared up.
FEALF is not completely happy about the report situation. Because of the paperwork involved, some of the first tests are submitting 100% of reports. But if any specific note of tire wear is submitted, they have to be reviewed. URs would be forwarded to FEALF and quick checking with other units would be able to establish the trend to determine whether a faulty tire had been received in a factory inspection had been deluged.

Thus far there has been no need for such investigation.

► **General**—Other points made by Berner and Cox:

• Tire life is interrupted with C-124 tires because they are occasionally delayed to reduce the report pressure on reports in Korea.

• Several combat units which arrived in the theater with 10-15 tires have switched to 12-15 because of the additional safety factor.



BOEING TESTS INVERTERS

Believed to be the first of its kind, this new device tests aircraft inverters before their installation in airplanes by the Boeing Airplane Co. at Seattle. Units are run up to full

load within one minute, making rapid test run possible. The new device was designed by Henry Deane (shown from left) of the Boeing engineering department.

Scintilla Strong in Canadian Market

Scintilla-Scintilla has a virtual monopoly in Canada, according to the Seattle, N.Y., manufacturer. The only other analysis in the area is BPS (British Thomson Houston) units currently used by Trans Canada Air Lines, Scintilla states. But TCA has ordered Scintilla instruments for its eight functioning Super Constellations, the airline adds.

Scintilla lists three other Canadian users of its ignition system:

► **Royal Canadian Air Force**, which has adopted the unit as standard throughout its service, says Scintilla.

► **Royal Canadian Navy**, which also has standardized on the instrument. Navy's equipment program is self steering, according to Scintilla.

► **Hillinger-Caplan Transport, Ltd.**, which will install the unit on its system.

► **Electric Auto-Lite, Ltd.**, says the Scintilla is best in its automotive ignition.

Representatives for all these sales are credited to Scintilla's Canadian representative, Atlantic Electric Co., of Montreal.

OFF THE LINE

A half-million-dollar, mechanized engine overhaul shop to be built at San Francisco Airport by The American World Airways, will perform all major engine overhauls for Pan Am's major Pacific Airlines fleet from being done by Pacific Aerospace Co. at Honolulu, so long with the airline's long established policy of doing its own overhaul work whenever possible. Engines to go through the shop, Boeing B590s, DC-46 K1200s and T46-2200s. The facility will begin operation in a year and will be in full swing three months later, according to PAA.

None less Constellation wing flap drive motors has been substantially cut by dismounting the motor and using flexible hose to hook it into the bicycle system.

A. E. Urganis & Associates, a New York expert and consultant engineering firm, has been appointed purchasing agent for British European Airways. The company has been asked to make tender contracts for the Airbus and Airbus, for the last two years.

A horizontal riserless actuator, capable of withstanding one load as to 160,000 lb., is being manufactured by Aero Astro Risers, Telford, for the Gliese 1.

Marine-built two jet Constellation. The unit, labeled M-4850, features a lightweight, multi-disk clutch, shock-absorbing ring springs and a position indicating servo transmitter attached to the rotating servo, according to Air Associates.

Ignition Harness Test Simplified for EAL

An investment of less than \$100 in some test equipment has saved Eastern Air Lines thousands of dollars annually, the carrier says.

The equipment is a special chamber

for checking out low tension ignition harness. Reading as low as 3000 ohms, it has cut overhaul time for each harness from eight hours to two hours, and reduced material waste. It was designed and built by Eastern by Donald Radio Sales and Service Co., Miami.

The meter is so sensitive it can detect a single broken strand or a poor solder joint in an ignition harness with 40 conductors of seven strands each, EAL claims. The meter not only indicates from but pinpoints them, making it possible to replace only defective parts instead of the entire assembly. Before, Eastern found it necessary to damage both each harness and replace all wiring.

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FINANCIAL

The Bankers Look at Air Financing

- IBA report tells why carriers, despite huge capital expansion, need little aid from investment bankers.
- Study also expects copters to benefit if noise from jet transports forces airports farther from town.

While aviation industries have been enjoying a steadily increasing volume of business, they have required a more modest amount of capital financing than most other major industries.

This is one of the important points made in the special report presented to the recent convention of the Investment Bankers Association by its Aviation Securities Committee. The report of the committee, which was under the chairmanship of Hugh Kaulbach of Kohn, Loeb & Co., appears to have more substance than similar reports prepared by just committees.

Air Transport

The carrier is preferred in a period of increasing gross income while also

units expanding their capital assets. Because of light capitalization is primarily responsible for the large level of capital expenditures presented to reach the estimate of more than \$750 million by the middle of 1959.

But the current industry reports that for large increase of capital expenditures is being incurred, for the most part, outside of current investment buying channels. The loss for this situation is currently noted in the IBA, Aviation Securities Committee report.

► **Fast Depreciation**—The management of the airlines have considered it prudent to depreciate their flight equipment over periods ranging from five to seven years, shorter by far than the depreciation life of the capital assets of other

business. This has resulted in larger annual charges for depreciation than if this equipment were depreciated over a long period of time. To date such annual depreciation charges have been allowed by the government for income tax purposes, thus lowering the airlines and increasing the amount of available cash flow.

The airline business has been fortunate enough in recent years to generate sufficient cash funds to meet such depreciation charges. Therefore, the annual depreciation charges of the airline industry have made such an important contribution to new capital funds as to make it possible for the airlines to finance their needs either out of internally generated funds or such funds supplemented by bank borrowings.

The report further notes that from the end of 1950 to the end of 1951, during a period of great expansion in the airline industry, the long-term debt of the domestic airlines decreased. This debt was reduced from \$148 million to \$124 million.

So long as the new capital requirements of the airline industry are generally for light equipment and so long as it is prudent and possible for airlines to depreciate their equipment in a relatively short period due to the annual obsolescence, the neediest way for airlines to meet new capital require-

ments which cannot be provided out of cash earnings, is by the issuance of common stock, as by the members debt obligations, instead of continuously with the depreciation of the financed equipment.

The reason for the failure of more equity raising financing is attributable to the overpricing of new. Last expansion of stock of this group during 1952, then costing a market decline unfavorable for financing capital requirements by means of new stock issues.

The decline prevailing toward air line stocks is blamed on the decline in airline earnings during 1951. Special tax recovery cases such as the closing of the Nevada Airport resulting from the three accidents in Elizabeth, N. J., and the curtailed operations resulting from a period of gasoline rationing caused by the oil strike, contributed to the decline.

► **Narrowed Profit Margins**—But the narrowing profit margins are held chiefly responsible for the industry's current condition.

The report observes: "Rates have declined in the face of mounting costs for materials and labor and heavier tax burdens. This is not the first time that the industry has pursued the secondary earning rate in spite of the increasing demand for seats and other space. The airline industry seems to be unique in its habit of decreasing the price of its product when the demand is great and attempting to increase its price when the demand has fallen off. The present tendency toward lower rates is due partly to government fine, CAB, and perhaps even importantly to the development of truck service with its lower fares."

It is probably still too early to say categorically whether the tremendous growth of coach travel is a healthy thing for the airlines. It is true that it has stimulated the demand for the aircraft product, but at what cost? The answer will be shown in the next year or two. Meanwhile, the fact remains that unless the decline in profit margins can be turned the airlines will be facing a period of profitless prosperity.

► **Risk Review**—Alfred T. Weinstein suggests a "complete review on a high governmental level of the role policies of the airline industry, including not only passenger rates but expansion, cargo, and mail as well. In the matter of mail rates, the year 1952 has seen a reduction in rates by the CAB which, of course, has had its effect on airline earnings."

"The primary function of mail rates is to act as a unit of pressure on one rate, geared to allow the firm to use a reasonable return on their invested capital. To reduce them is the last of

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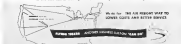
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a deckling average trend such as was done earlier this year does not seem to be consistent with the concept under which the airline service must pay.

• In the General Public, a more hopeful view of the airline outlook is projected for when the present expansion program is completed, by mid-1964. It is felt that the benefits of modern equipment will serve as being about as a result in net profits, provided the traffic demand keeps pace with increased productivity of the new aircraft. This will be reflected by two things:

• The general level of business.
• The ability of the airlines to please the traveling public with the services they offer in competition with other forms of transportation. "The airline industry can be said to have come of age, but now that it is a well-defined unit it must be ever vigilant against a deterioration in the quality of its service. By this it means not only speed and safety, as we must all the common elements involved in the transportation of passengers."

The importance of maintaining an increasing demand for airline service is clearly stated in the face of the air travel market in the industry's expectations.

Two encouraging developments have been noted, through the progress of expansion and equipment interchange programs.

• Jet Transport—Significant observations are advanced as to the potential of jet transport. "The report notes:

"In spite of all the publicity given to the subject, it appears that even the most ill-fated Mark III Comet, the most advanced jet transport on the horizon, will not be successful in the market and it does not seem probable that a jet transport, suitable for operation by our domestic airlines, will be in service by at least one year."

"In addition to the fact that the present-day jet is prohibitively expensive to operate, there are technical obstacles in the way of incorporating it into service on the highly controlled routes of this country. In addition, the same made by jet transport, suitable for operation by our domestic airlines, will be in service by at least one year."

"As a result of this development one can see another important role to be played by the helicopter as carrying passengers from the coast of cities to these relatively distant airports."

Airfreight

While it is noted that the airfreight business is saturated with an optimum in large and long hauls, it has not increased in basic facilities, ranging from the fact that the plane has not yet been built which can carry goods through the air cheaply enough to compete with other forms of transportation.

Manufacturing

A more favorable view is generally afforded the aircraft manufacturing industry. Prospects for increasing high volume are expected good for at least three years. On the question of profit margins the report says:

"When the net margin has reached a point between 11% and 20% of sales, as it does today, it cannot be expected to go any lower. It is believed that the industry has already absorbed the greater part of the cost impact without open large scale expansion and while further increases in wages may have to be faced, the industry's principal customers, the government, will have to bear the brunt of these under the existing clauses in its contracts."

While prospects for the aircraft manufacturing are expected to show steady improvement, this development is not expected to be paralleled by the likelihood of public financing in the same measure. Self-liquidating loans, however, may be possible through Volume guaranteed by the military services have taken the brunt of the industry's loan requirements.

The technical accomplishments of the aircraft group are accorded recognition and provide the basis for the conclusion that while the "airline industry takes to the air with jets it will be with planes of American manufacture."

—Rolf Atchard



The Airplane

(Advertisement)

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through a pump, forces it through a desiccant jar, and returns dry air to the breathing tank. The Lear Riverer Type B1A desiccator is a condenser trap system, with the exception of a heater to replace an air.

Rossco is supplying the desiccator to the mechanical division of General Mills, Inc., for use with breathing apparatus for B-47 Strategic bomber.

The air pump motor is rated at 1/30 hp at 27 x 4 x 3.5 in. The main feature describes it as a continuous duty, explosion proof type, with a bench life of 100 hr. at 4500 R.P.M.

Lear Inc., Romeo division, Elyria, Ohio

Improved Gas Filter

A new refueling tank filter now clears 99% of all particles larger than 5 microns from aviation gasoline, according to the manufacturer. It has new impregnated filter elements and is available in models from 35 gals. capacity up. The filter can be installed on existing tanks either vertically or horizontally.

Puracolor Products, Inc., Rahway, N. J.

ALSO ON THE MARKET

New plastic cable clamps save weight but are strong enough to take on the job of conventional clamps according to the manufacturer. Made of Sarns thermoplastic, the clamps are said to resist fungus and other environmental conditions encountered in military applications. Hobbs Industries, Inc., Norcross, Ill.

Hand files made to very close tolerances are designed to permit precision finish. They are thinner and more flexible than usual. The manufacturer describes its product as one in "one like a hand touch" thus a file. Taconic File & Hardware Co., Philadelphia.

Better quality control can result with use of acrylic photo mask of latex precision finished black granite. The permit positive measurements, have a guaranteed surface accuracy of .0005 in. Lenkey Canada Surface Plate Co., 3412 Pickard Bldg., Philadelphia.

Portable television for industrial use has self-contained closed circuit and can be used with standard television receiver. Kit can be adapted for wide variety of jobs. Typical examples are: diagnostic inspection tasks, operation hand to see, and multiple viewing. Dugan Electronics Corp., North Grove Ind.

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AIR TRANSPORT



LITTLE SKYWAY FLEET of Avianca Nacional Del Agno Cessna 170s and 180s throng the apron at the carrier's home base, Ginep, Ecuador. The tiny single-engine craft have assembly lines on daily scheduled airline services and handled the job with no accident.

South American Airlines Use Lightplanes

- Some equal DC-3 speed; allow easy maintenance.
- Plane market upped by pilot training programs.

By Alexander McHenry

Wilets—More than 180 Cessna all-metal line place 170s and five place 180s are an scheduled airline and unscheduled airline service in South America. Great Britain, Cessna report sales through, told Aviation Week.

The small single-engine plane has made public transportation in areas where airports and traffic density will not permit use of large equipment. Cessna says, and already have proved a valuable means of augmenting the private plane transportation facilities in many areas.

► **Smallplane Market**—Cessna has seen a steady and growing marketplace in South America as additional airline and air taxi services begin using the lighter planes in regions where other transportation still is primitive.

He says the simplicity of high wing, all-metal aircraft with fixed conventional landing gear lends itself to simpler maintenance operations for small operators. Cessna also points out that the 165 mph cruising speed of the Cessna 185 is comparable to DC-3 operational speed. While the 170 cruising speed is about 138 mph, this still is several times faster than the speeds of surface transportation over much of the terrain which the planes cover, Cessna says.

► **No Accidents**—Most active all-Cessna operated airline operations in America



ONE OF TWO Cessna 170s operated by British Colonial Airlines, British Honduras, is in two part job. Good cost-benefit performance has spread 170s use.

Nacional Del Agno (ANIDA) based at Cayash, Ecuador. The airline runs a fleet of 12 Cessnas, nine 170s and three 180s, on regular daily schedules to eight cities in Ecuador and one in Peru.

ANIDA has operated for more than three years without an accident, Cessna says. At this time, it has limited approximately 12,000 passengers over segments of the 133 mile air route extending from Tumbes, Peru, to the Peru-Ecuador border, to Esmeraldas, metropolitan city and airport of Ecuador.

Aerovias Nacionales De Colombia (Aerovias), a Pan American World Airways affiliate in Colombia with head quarters at Bogota, recently took delivery of its fourth Cessna 195. The aircraft is the highest-powered version of the 190 series with a Jacobs 360 hp radial engine and 165 mph cruising speed. Aerovias also has a Cessna 170.

The airline currently operates in the Llanos plains section of Colombia and also flies into Medellin and Barranquilla, Colombia.

Although the 195s are designed as five-place craft, they sometimes carry as many as five passengers plus pilot in the Colombian operations. The Aerovias

170s despite its small 145 hp. Cessna radial engine and door-plug design—smooth, curved door passenger plus pilot on a semi-rigid pilot high-altitude operation over the Colombian mountains.

British Colonial Airlines, operating with its main base at Belize, British Honduras operates two Cessna 170s and the others operate three 170s or more. Some of the operators fly deep into the interior of Brazil.

Chastain says his distribution report shows as many as 15 operators companies in Brazil. One operator near Cessna 170s and the others operate three 170s or more. Some of the operators fly deep into the interior of Brazil.

Additional air taxi companies are being set up or are in operation in Argentina and Chile with four place 170 equipment.

Details on the extent of these operations are not available yet.

► **Training Program**—Another facet of the Cessna program in South America not directly connected with air transport is standardization—the two-place Cessna 140 and the four place 170 as the training airplanes for government-sponsored pilot schools.

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Write a letter to Bill Hays, Director of
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Domestic, International Airlines Incomes 1952

DOMESTIC TRUNK AIRLINES

	Amount	% Change from 1951
Passenger revenue	\$665 million	+17
Mail revenue	17	+2
Express revenue	13	+2
Freight revenue	25	+21
Other revenue	15	0
Total operating revenue	725	+18
Total operating expenses	663	+20
Net operating income	94	+18

NOTE: Estimates based on nine months' financial data.

Net operating income excludes federal income taxes and non operating income and expense.

INTERNATIONAL AIRLINES

	\$100 million	% Change from 1951
Passenger revenue*	52	+13
U. S. mail revenue*	52	+8
Foreign mail revenue*	10	+3
Cargo revenue*	27	+9
Express baggage revenue*	4	+17
Non-scheduled revenue	4	+9
Total operating revenue	307	+13
Total operating expenses	303	+9
Net operating income	32	+67

NOTE: Estimates based on nine months' operating in 1952.

Revenues exclude 13 million bank transfer credit in April, 1951, to September, 1952, in Pan American. Revenues also exclude "unscheduled" non-trunk revenue*.

*Scheduled operations only.

Airline Profits Drop in 1952

ATA reports revenues up, but profits reduced by expansions, soaring labor and material costs.

Airline profits reported for 1952 will average less than 1951 record levels, although revenues are up 14% to all about \$1.25 billion. Passenger revenue will grow another 10 to 15% in 1953, but it is too early to estimate industry profitability.

The profit picture is highlighted in a national projection of airline revenue and expense by Dr. Lewis C. Sox, chief director of the Air Transport Association's Research Division. Scheduled domestic trunk airlines' 1952 profits before income taxes will drop 10% below last year to \$94 million. International lines' net before tax will drop 62% to about \$5 million. Non-scheduled airlines' reported earnings will be up 44% to about \$3 million, net, including the savings of taxes.

Cape Canaveral, Fla.—Domestic trunkline profit average gained 85% last year to \$777 million, while expenses increased 28%.

International

revenues gained 9% while expenses went up 13%.

The cost per profit picture may not be repeated in the coming year, if Dr. Sox's predictions of a 10 to 15% further revenue gain is correct. Some of the 1952 problems were non-recurring in nature. These items include:

- New equipment cost. Many new fleets were introduced to schedule service this year, with consequent high installation costs. Individual airlines will continue adding new equipment in 1953 perhaps with no more tool impact than in the past year.
- Operational losses. From the New York Airport shutdown last winter through the airlines gas shortage last May, the airlines generally took hard knocks that last summer severely in the fuel bill of the year.
- Rising labor and materials cost might cut earnings through 1953 as compared as in 1952.

One factor that will continue to

Incomes of Irregular, Cargo and Local Service Carriers for 1952

IRREGULAR SERVICE CARRIERS

	Amount	% Change from 1951
No. of passengers	719,184	+13
Rev. passenger miles	1.1 billion	+21
Cargo ton-miles	75 million	+4
Total revenue	\$215	+27
Total expenses	62	+21
Operating profit	3	+44

NOTE: Estimates based on % increase first nine months 1952 over same period 1951.

CERTIFICATED CARGO LINES

	Amount	% Change from 1951
Freight revenues	98 million	+9
Operating revenue	515	+1
Operating expenses	17	+10
Operating profit	1	+61

NOTE: Estimates based on nine months' operations.

LOCAL SERVICE LINES

	\$75 million	% Change from 1951
Passenger revenue	20	+16
Mail revenue	20	+13
Other revenue	6	+10
Total revenue	46	+14
Total expenses	40	+17
Operating loss	1	

NOTE: Estimates based on nine months' traffic, in months' financial reports, with no annual totals of revenues and net profit for the second half, 1952.

about 70% of the airlines' profit margins in the coming year is lower but factors due to the introduction of larger fleets. The 1953 losses were almost half high.

ATA Secretary—The ATA estimates for overall U. S. air carrier revenues, including scheduled in 1952 is passenger revenue \$945 million, 17% more than a year ago, mail revenue \$115 million, down 1%, cargo revenue \$127 million, up 5%, total revenue \$1,187 million, up 14%.

Proportions of the domestic trunkline losses were 20% greater than national figures totals in 1952.

Air freight volume of the certificated cargo carriers fell off about 8% although increased rates brought revenues almost equal to 1951. With costs up 10% and slightly less, profits were expected to average less than \$1 million altogether.

Three preliminary figures (not to be) prepared by Dr. Sox of ATA are based generally on the nine-month financial data of the 14 domestic trunkline, 11 scheduled lines of the U. S. flag, 4 local service, and about 10 non-scheduled lines. Territorial and Alaska carriers are excluded from the list.

More Named Head Of North Central

North Central Airlines has appointed Howard A. Mory as president, replacing the late Donald A. Duff. Board chairman F. A. Mueller had served as acting president after Duff's death Nov. 14.

Mory was director and corporate vice president of North Central and also has been fixed-line aviation operator since 1937. He has been chairman of the Wisconsin Aeronautics Commission since its founding.

North Central, formerly called Wisconsin Central, had signed a merger

agreement with Lake Central Airlines. CAB approval of the merger depends largely upon Mory's success in cutting costs, which have increased more than the industry average during the company's unsteady growth.

New Garuda Flight

(McGraw-Hill World News)

Melbourne—A regular air service to Japan is being planned by Garuda Indonesian Airways, but certain equipment and financial problems remain unsolved. Although some quarters advise purchase of U. S. aircraft, Indonesian air the orders will be placed in Europe or England.



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What's CAA Doing About It?

The Civil Aeronautics Administration's information office told a national magazine recently that one of its articles critical of CAA, and others, really involved malfunctions of automatic feathering of propellers as well as of reversible propellers.

Since the theme of the article was reversible props, CAA then accused the magazine of inaccuracies.

After a briefing on automatic feathering difficulties, we are inclined to ask the two chiefs of the Office of Aviation Safety, James Hensley, and his assistant, Will Ross Davis, what they have been doing to clear up these automatic feathering problems, that are as dangerous potentially as the well-publicized malfunctions of reversible propellers.

We have made a spot check, that fails to disclose satisfactory action by Hensley, Hensley and Davis. We find that experienced men in CAA are aware of the hazards but are powerless to bring dramatic action. One of these experts explains it this way:

A heavily loaded twin-engine aircraft (CAA authorizes higher gross loads if the plane is equipped with automatic feathering) suddenly loses 50% of its power at takeoff, the most critical portion of flight. The power loss develops not because anything is wrong with the engine, but because of pilot misadventure.

Here is a typical example of an actual case, one of scores, taken from CAA's Daily Mechanical Reports.

"On takeoff, right propeller auto feathered, with ensuing climb-out, no evidence of malfunctioning of engine. Engine was auto feathered and operated normally and flight proceeded to —. Investigation revealed that, in target pressure line of torque pressure switch, which caused auto feathering. Also changed feathering switch, auto feathering relay box, propeller governor and torque switch in a precautionary measure. Propeller controls were inspected and found normal."

When is a safety gadget not safe? Suppose the other engine had failed at the same time? After thorough investigation of the fatal accident would the following perhaps have been contained in the findings on "probable cause?"

"During takeoff the left engine apparently failed and auto feathered. Aircraft could have been safely continued in flight with the proper flying techniques since right engine was found to be entirely inoperative. However, evidence indicates one of the pilots feathered the good engine, thus depriving the aircraft of power, after which the crash occurred."

Experts who deplore the current lack in the Office of Aviation Safety on this subject also used as another example from the Daily Mechanical Reports, this one involving a four engine aircraft:

"Aircraft feathered around No. 4 propeller feathered in cruise without warning. Additional information advises that Maintenance personnel checked propeller operation with engine running and were unable to duplicate this condition. No. 4 propeller governor and feathering switch were changed in a precautionary measure. Entire

propeller electrical control of engine was checked and found normal. Aircraft was test flown and again condition could not be duplicated. Aircraft returned to service."

Now, Messrs. Hensley and Davis, what is your "adventurously qualified" team truly doing about these and other hazards of aviation?

Tackling Airline Costs

Northwest Airlines declares in a press release none of the costs of providing luxury accommodations at no extra charge for its first class passengers.

"Many seat and tray costs \$14.40 and it requires 75 to each Stratostation," the company says. "Fittings for the seat tray are listed at \$116 each, while drinking glass holders are \$6.77, starvel retaining rope \$11, starvel head rail \$70.75, luxury compartment chair \$1,192, seat arm with \$675. . . ."

Northwest says total costs of parts and supplies it must keep on hand at all times, including 50,000 parts for the Stratostations alone, amount to about \$11,500,000.

Some carriers have been making more progress against high costs and complexity than others. The local service lines and operators showing lower fare costs service have led the field, but everybody has a long way to go before the money fly.

Don't misunderstand us. If the passenger, in order to get his money, is willing to pay for extra costs, including whatever meal subsidy may be involved, then it is his privilege to do so. That is the American way.

But in order to please the luxury rider don't let a peacock the little fellow, and by enforcing high fares deny him the opportunity to fly safely.

Why should we let the million of families to mass, buses and cars without a struggle? We'll be glad we have the masses already sold when or if we let a national transportation dilemma. We'll also be glad we will have reduced complexity and costs.

Some of the airline luxury proponents have been trying to shoot holes in the lower costs at current that speculate in coach services. They have sought to imply strongly that higher costs always bring greater passenger safety.

It is hard to imagine a non-scheduled carrier, for example, competing to pay \$14.40 apiece for its seat trays, \$116 for every six tray fitting, \$6.77 for drinking glass holders, \$11 for retaining rope, \$70.75 for a head rail, and \$192 for an arm rest.

It also is hard to imagine low extra expenditures for airlines at Northwest machines could improve the passenger's safety. It is a good guess, however, that they help keep fares as high as the traffic will bear.

At Northwest would be among the first to concede that it offers both coach and luxury flights—there are many cost differences between classes of service, and not all of them involve the safety element, by any means.

Sometimes, we come with little really tackling aircraft and service complexity, and high costs. When we do, we suspect progress will start a little faster. The public, as well as aviation itself, will be the winner.

—Robert H. Wood

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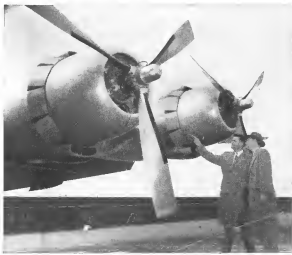
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1935 to 1946, from a point that the



HERE'S DRAMATIC PROOF of the damage an arcing fault can cause in an aircraft. To get this picture, G-E engineers arranged a makeup

of an aircraft electrical system, then touched the generator power cable against a test airframe. Note the white-hot glare at point-of-contact!

G-E "PROTECTION RESEARCH" REDUCES ARC-FAULT HAZARDS IN AIRCRAFT



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